

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

WHAT DOESN'T GET MEASURED – DOESN'T GET DONE

Implementing Continuous Process Improvement in the Air Force Reserve

by

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Abbreviations

| | |
|-----------|---|
| AF | Air Force |
| AFGM | Air Force Guidance Memorandum |
| AFPN | Air Force Print News |
| AFRC | Air Force Reserve Command |
| AFRCMD | Air Force Reserve Command Mission Directive |
| AFRCMS | Air Force Reserve Command Manpower Standard |
| AFS | Air Force Specialty |
| AFSC | Air Force Specialty Code |
| AFSO | Air Force Smart Operations |
| AFSO21 | Air Force Smart Operations for the 21st Century |
| ART | Air Reserve Technician |
| BB | Black Belt |
| BCA | Budget Control Act |
| CPI | Continuous Process Improvement |
| CPI-MT | Continuous Process Improvement Management Tool |
| CSAF | Chief of Staff of the Air Force |
| DEPSECDEF | Deputy Secretary of Defense |
| DoD | Department of Defense |
| DoDI | Department of Defense Instruction |
| DON | Department of the Navy |
| DRU | Direct Reporting Unit |
| FM | Financial Management |
| FOA | Forward Operating Agency |

| | |
|------------|-----------------------------------|
| FY | Fiscal Year |
| GB | Green Belt |
| GM | Guidance Memorandum |
| HAF | Headquarters Air Force |
| HQ | Headquarters |
| LSS | Lean Six Sigma |
| MAJCOM | Major Command |
| MO | Manpower Office |
| MPO | Master Process Officer |
| NAF | Numbered Air Force |
| OSC | Organization Structure Code |
| PPSM | Practical Problem Solving Method |
| RMD | Resource Management Decision |
| ROI | Return on Investment |
| SECAF | Secretary of the Air Force |
| SECNAV | Secretary of the Navy |
| SECNAVINST | Secretary of the Navy Instruction |
| SLC | Senior Leader Course |
| SSN | Social Security Number |
| UMD | Unit Manpower Document |
| WPM | Wing Process Manager |

ABSTRACT

Decreasing defense budgets have highlighted the critical need, in recent years, to maximize the efficiency of the processes that support and deliver effective combat capability to the warfighter. To address this critical issue, the Air Force (AF) is attempting a transformative effort to instill a Continuous Process Improvement (CPI) mindset into its culture. Known by its program name of AFSO21 and now AF CPI, this program seeks to train and certify an organic cadre of CPI practitioners to support the use of its standard problem solving process known as the AF Practical Problem Solving Method (PPSM) to solve mission critical process deficiencies. The PPSM leverages several industry proven CPI methodologies to address wasteful activities, constraints, and variation in processes in order to improve efficiency in terms of resource consumption in relation to process output. As a Major Command (MAJCOM) of the AF, the Air Force Reserve Command (AFRC) is attempting the same transformation in its unique Citizen Airmen culture with limited results. An assessment of the how effectively the AF CPI program is being implemented in terms of CPI practitioner training and certification, senior leader education, and CPI project effectiveness, suggests that leadership at all levels must take ownership of the program soon or any remaining momentum towards the ultimate goal of incorporating a CPI into the culture will be lost and the initiative will fail.

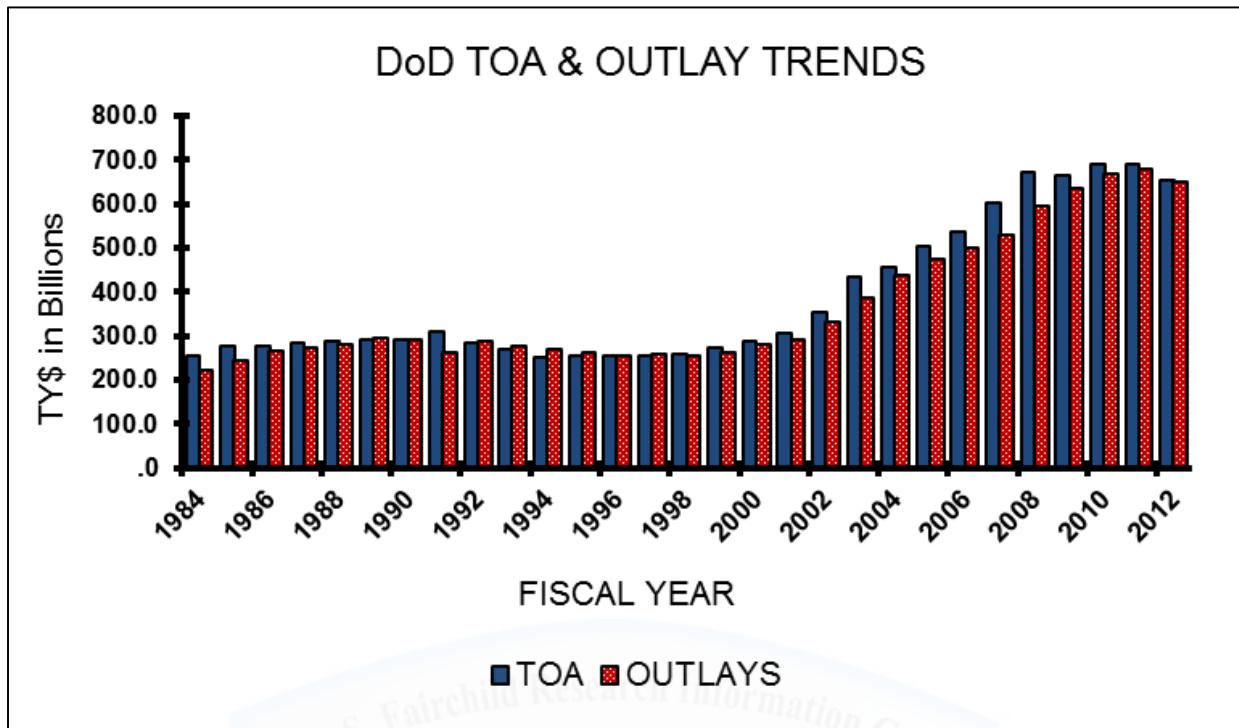
INTRODUCTION

Gentlemen, we have run out of money; now we have to think.

-Sir Winston Churchill

Data from the United States Air Force Statistical Digest for Fiscal Year (FY) 2012, illustrates the impact that the events of September 11, 2001 have had on the Department of Defense (DoD) budget. Figure 1 shows increases in DoD spending each year after 9-11 until measures enacted by the Budget Control Act (BCA) of 2011 reversed this trend through the implementation of sequestration when congress failed to come to an agreement on a deal to reduce the federal budget by \$1.5 trillion over 10 years and did not pass legislation to codify it into law by the deadline of 23 Dec 2011.¹ The spending cuts enacted by sequestration went into effect on 1 March 2013 and resulted in a 7.7 percent reduction, a total of \$42.7 billion, in the DoD budget for FY2013.² Even before the imposed cuts occurred, the chart in Figure 1 shows that the DoD budget had already begun to decline by FY 2012 but this may be as much a reflection of an election year decision to reduce the military presence in Iraq as an attempt to get the budget under control. To make matters worse, the BCA enacts ever decreasing budget caps in FYs 2014 through 2021 and backs them up with additional sequestrations if the required annual budget reductions are not achieved.³ The bottom line for the DoD going forward is bleak. With a shrinking budget, it must find ways to sustain the military force and capabilities needed for current operations while, at the same time, investing in the capital needed to develop the force needed for the anticipated operations of the future.

Figure 1. DoD Total Obligation Authority Outlay Trends 1984 - 2012



SOURCE: OSD Comptroller (Program & Financial Control)

Well before FY2011, it was evident that military leaders were already experiencing the budget balancing woes of having to fund today's long war to the detriment of preparing for an uncertain future. In 2005, the DoD embarked on an initiative to standardize efforts already underway by the military departments to incorporate the capability and capacity to use industry proven industrial engineering techniques to improve the effectiveness and efficiency of institutional business processes. If the military could no longer afford effectiveness at any cost, it would be necessary to convert the resources reclaimed by maximizing the efficiency of processes into more combat capability.

In the case of the Air Force (AF), then Secretary of the Air Force (SECAF) Michael W. Wynne and then Chief of Staff (CSAF) T. Michael Moseley initiated formal efforts to begin a service-wide CPI program by issuing a memorandum announcing an initiative to capitalize on

the prior successes the AF had realized in applying the Lean process improvement methodology to logistics and maintenance functional areas.⁴ This initiative rapidly grew into a full blown lean deployment transformation effort called the Air Force Smart Operations 21 (AFSO 21 and later AFSO21) program complete with its own program office aligned directly to the staff of the Office of the SECAF. Being a MAJCOM of the AF, the Air Force Reserve Command (AFRC) followed suit and, in 2007, established its own program office and charged it with implementing the AFSO 21 program command-wide. With respect to the overall implementation of the program across the entire AF, from the AFRC program office down to the field level, the command has executed its implementation of the program largely in a manner independent from the active component. For this reason, the effectiveness of program implementation in the reserve component is predominantly the result of parallel but independent efforts and should be studied as such. The issue this paper seeks to address is whether the Air Force Reserve Command's implementation of the AFSO 21 program is producing results that could be interpreted as significant evidence to determine whether the AFRC unique program is having the desired effect on the culture and producing positive impacts to mission effectiveness and efficiency.

A cursory analysis of the available data suggests that the AFSO21 program as implemented by AFRC is having little to no measurable positive effects on organizational culture or its key processes. This claim appears to be supported by the apparent lack of significant progress towards mandated Continuous Process Improvement (CPI) facilitator training targets in the nine years since program inception. Additionally, the education of senior leaders in how to lean and manage a lean transformation effort seems to be falling short of reaching the majority of AFRC key leaders. Further support for the thesis of this paper is evidenced by the lack of a

standardized process to produce the required data to needed to quantify individual CPI project returns on investment in common terms that can be aggregated and validated by command financial managers. If the required data is not captured and quantified during the execution of a CPI project, it is difficult and often times impossible to go back and get it after the fact.

This research paper will use the evaluation framework to objectively assess the current state of the Air Force Reserve Command's CPI program. Groundwork for the research will be in the form of a historical review of applicable program documentation through current day to include some context of what was happening in the other military branches as well as the DoDs efforts to standardize implementation of CPI across the department to promote efficiency. Evaluation of AFRC program implementation will involve the measurement of three key indicators of program effectiveness: CPI practitioner training and certification, Senior Leader education, and the effectiveness of CPI projects conducted.

BACKGROUND

Long before the DoD announced its intention to implement a standardized department-wide CPI program, the Army, Navy and Air Force had all already begun individual initiatives to incorporate the use of CPI concepts and principles to streamline the key business processes of each service. AFRC, as well as the other AF Major Commands (MAJCOMs), undertook efforts to implement the Air Force's new CPI program called Air Force Smart Operations for the 21st Century or AFSO21. These efforts continue today but the uniqueness of AFRC as the reserve component of the total force led to a divergence in how the program was implemented when the CPI program office, SAF/US(M)S, shifted functional responsibility for implementing program guidance to the Headquarters Air Force (HAF) Personnel directorate (A1). This divergence occurred because, AFRC leadership decided not to alter its program implementation from its

original course in response to the active-component-centric change of direction. This background review will highlight key program publications and documents in chronological order to provide the full context for how the AFRC CPI program has evolved to its current state as well as its relationship to the AF and DoD program implementations.

The Army was the first to issue a memorandum announcing its intent to deploy Lean Six Sigma (LSS) to transform “the institutional Army in order to ensure its ability to provide the people, training, resources, quality of life, and infrastructure that will be critical to the continued success of America’s Army.”⁵ The stated purpose of the memo was: “To provide preparatory guidance prior to the issuance of a deliberate plan in support of the Business Transformation actions directed through the implementation of instructions for the Secretary of the Army Transition Team.”⁶ In the memo, Lt Gen James L. Campbell, then Director of the Army Staff, outlines a concept, schedule, and preparatory actions to be accomplished for the deployment of LSS “to meet the challenges posed by an ambiguous, uncertain international security environment” by achieving a “high level of continuous measurable improvement in its business processes and functions.”⁷ The initial preparatory tasks were for organizations to “Designate a Deployment Director who will lead business transformation” efforts and to “conduct individual assessments of [the] workforce to determine the aptitude of [the] personnel to undergo varying levels of Lean Six Sigma training and certification to either participate in improvement projects, to lead major or minor improvement projects, or to train and mentor those that do.”⁸ Additionally, organizations were tasked to “be prepared to nominate the number of individuals [they] consider[ed] necessary to train in a ‘train the trainer’ approach to implementing Lean Six Sigma. These actions would pave the way for the Army to “initiate the training and education

necessary to develop the Lean Six Sigma expertise and organizational structure required to succeed in this critical effort.”⁹

On 7 November 2005, Then SECAF Wynne, and Then CSAF Moseley, in a memorandum for all Major Command (MAJCOM) Commanders, announced their initiative to expand the application of the Lean process improvement methodology from use in Air Logistics Centers and “some maintenance areas over the last 4-5 years” and deploy it AF-wide. They called this initiative “Lean across the Air Force.”¹⁰ In the opening paragraph, they explain the need, or “burning platform” for this initiative this way: “We must find a way to generate savings within our constrained budget that can be applied to the pressing need of recapitalization.”¹¹ They go on to say that their “strategy will be a comprehensive effort to improve our work processes across” the AF.¹² Like the Army memo before it, the directions contained in this memo were preparatory with the only task being for each MAJCOM commander to send their vice commander “and an alternate to a two-day session (13-14 December) to learn about deploying Lean across the Air Force” and “develop a roll out plan for this initiative.”¹³

The project name, “Lean across the Air Force” didn’t survive past the December 2005 planning session. An Air Force Print News (AFPN) story, published on 9 January 2006, captured SECAF Wynne’s announcement, during a conference, that “the Air Force used the best parts of several efficiency programs to develop an Air Force-unique process improvement program called ‘Smart Operations 21.’”¹⁴ He explained the development of the new project name in this way: “The name came from a convocation of the senior operators in the field who thought we could continue our journey into higher quality and better performance by using a term that would relate to airfield operations, intelligence, surveillance and reconnaissance operations, unmanned aerial vehicle operations or cyberspace operations.”¹⁵ He went on to explain that the program

would be “based on both Lean and Six Sigma business process improvement tools” with a “focus on increasing value to customers, save[ing] time and money, reduce[ing] waste and improve[ing] quality.”¹⁶ The program name, “Air Force Smart Operations 21” or “AFSO 21” was born.

On 8 March 2006, SECAF Wynne released a “Letter to Airmen” entitled “Air Force Smart Operations 21.”¹⁷ In his letter, he talked about how the initial efforts to deploy Lean in the AF had grown into a “dedicated effort to maximize value and minimize waste in our operations” called AFSO 21.¹⁸ He explained that AFSO 21 will be “a shift in our thinking” that is “centered on processes (groups of tasks) rather than tasks alone, which allows us to gain insights into the value, or lack of value, in each task we perform.”¹⁹ He further explained that even though “we must continue to meet our worldwide requirements even with the continued pressure on our budget”, “AFSO 21 is not about cost cutting” – it’s about culture change.²⁰ Though the message in the letter was for the entire AF audience, it did contain an important message for a specific subset of the audience - a message that would be repeated in several future communiques. Specifically, SECAF Wynne stated that “AFSO 21 is a leadership program for commanders and supervisors at all levels.”²¹ He concluded the letter by announcing to Airmen that AFSO 21 training would be coming to each base and if they wanted to learn more in the meantime, they could visit the program website.²²

The Department of the Navy formally initiated its own service-wide CPI deployment program in a 3 May 2006 memorandum entitled “Transformation Through Lean Six Sigma”, issued by then Secretary of the Navy (SECNAV) Donald C. Winter.²³ The overall themes expressed in this memo were very similar to the sentiments expressed by the Army and the Air Force. In the memo, SECNAV Winter stated that “We face additional fiscal pressures that lead us to better stewardship of taxpayer dollars where greater efficiency leads to improved

effectiveness” and that “LSS is a proven business process that combines the strategies of Lean (eliminate non-value added activities and improve cycle time) and Six Sigma (reduce variation and produce highly repeatable processes).”²⁴ What is also evident from this memo is that fact that, like the Air Force, “several elements of the Navy and Marine Corps” had already been “engaged in LSS activities” prior to the department-wide roll-out. The Navy’s accomplishments with LSS prior to the initiative to expand its use across the service were noteworthy and indicate that those elements that were using LSS, had been using it successfully for a significant amount of time. Specifically, they had already trained “over 500 Black Belts”, “1500 Green Belts” and “facilitated 2,800 events and projects” which averaged “a 4:1 return on investment.”²⁵ The SECNAV’s message was to the point and clear: the “creation of more readiness and assets within our budget through LSS.”²⁶ In much the same way as the Army and Air Force had done by way of initiation, this memo announced a 15 June “deployment session” for the addressees with the stated objective to “establish a common knowledge baseline among participants; review examples of successful commercial implementations; assess current LSS implementation in the Department; and establish the next steps toward more fully employing LSS in [the] organization.”²⁷

Eight days later, on 11 May 2006, then Deputy Secretary of Defense (DEPSECDEF) Gordon England issued a memorandum announcing the “Establishment of DoD-wide Continuous Process Improvement (CPI) Programs.”²⁸ In the opening paragraph he states “the Secretary and I expect that every DoD organization is focused every day on improving the effectiveness of our support to the Warfighter” and that “this is particularly important now—given wartime demands, recapitalization needs, and fiscal realities.”²⁹ He goes on to say that the DoD “policy on the capture of benefits from improvement efforts is that cost savings and

expense reductions that result from improvements in overall operating effectiveness can be retained by the organizations that generate them” and that “effective management oversight should lead to reinvestment in additional CPI efforts and recapitalization.”³⁰ The memo did not prescribe any specific tasks but did communicate the department’s intent to “take action to institutionalize [its] CPI efforts including CPI expert certification, guidance documentation, and creation of forums to capture and share best practices.”³¹ Accompanying the memo was an attached “Continuous Process Improvement Transformation Guidebook” that provided a primer for the deployment of CPI intended to standardize the individual service transformation efforts already underway.

Over the next 11 months many Air Force organizations were making efforts to implement the AFSO 21 program. Up to this point in the transformation, there had been no express implications on existing organizational structures. In a 16 Feb 2007 memorandum, from SECAF Wynne to MAJCOM and DRU commanders, it is apparent that some units had taken steps to modify their organizational structures in different ways to create local CPI offices to manage program implementation. To address any issues that would result from a lack of coherency in AF CPI transformation efforts, the memo, entitled “Air Force Smart Operations for the 21st Century (AFSO21) Standardized Organization Structure Codes (OSCs)”, directed “all Major Command, Direct Reporting Units, and their subordinate units (Wings, Centers, etc)” to “realign existing AFSO21 Offices under the supervision of either the respective organization’s Commander (CC) or Vice Commander (CV).”³² This realignment would reflect through the use of two new office symbols or OSCs. These were specified to be CCO and CVO which were to be used to indicate whether the office was structured to report to the CC or CV respectively.³³ The memo

concludes by reiterating a point made in previous memos that “In order for our AFSO21 efforts to be successful, they must be led by commanders and supervisors at all levels.”³⁴

At about the same time the AF was taking measures to standardize the organizational structures that sprang up during the first year of its CPI transformation initiative, then Air Force Reserve Command Vice Commander (AFRC/CV) Major General Allan R. Poulin, transmitted a memo to the senior leadership of the command to announce plans for the roll-out of an AFSO21 training plan to be executed in a deliberate, top-down manner. The two key elements of the plan were identified to be “Senior Leader Training” and “Facilitator Training.”³⁵ The first element was targeted for senior leaders below MAJCOM level to be completed by 30 November 2007. During this phase of the training plan, the memo directed that all AFRC personnel would receive a 15 minute AFSO21 “Awareness Training” briefing at commander’s calls. For the second element, Maj Gen Poulin indicated that “facilitator training [would] begin in October [2007] and, using a tiered approach, [was] expected to be completed in approximately one year.”³⁶ In addition to communicating the details of the AFSO21 training plan roll-out, the memo also addressed the organizational structure concern that was the subject of SECAF Wynne’s standardized OSC memo. AFRC would re-purpose the existing wing “Performance Planner” positions and convert them to “become the Wing AFSO21 focal point (Process Manager).”³⁷ As a consequence of this re-purposing, the incumbents and appointees to these positions would receive training to become the first wave of certified CPI facilitators in the command.

On 27 February 2007, SAF/AA issued its “Use of Guidance Memorandums for AFSO21” memorandum to all MAJCOM commanders. The intended effect was to enable “*immediate* implementation of the results of AFSO21-related process reviews” by expanding the AF publication authority of “HAF two letters, MAJCOM, FOA and DRU commanders” to include

the issuance of “Guidance Memorandums.”³⁸ The general idea was to provide a vehicle for implementing process changes that would be impacted or prevented by current guidance as written. Guidance memorandums (GMs) could be issued to provide temporary relief from any policy constraints for up to 180 days. In that time, the issuer would have the opportunity to draft and coordinate permanent policy guidance incorporating the changes specified in the GM and publish it before the clock ran out. The memo closes by directing that “individuals participating in AFSO21 events will be made aware of this memorandum” as “it is the result of an AFSO21 event.”³⁹ Additionally it indicated that the instruction governing AF publications would be updated to include this new type of publication.

In October of 2007, SAF/US(M) issued a manual-like document called the Air Force Smart Operations for the 21st Century Playbook. It was intended to be used by leaders and AF CPI practitioners as a reference guide into the full body of knowledge concerning all aspects of the AFSO21 program. As there had been no issuance of any formal policy guidance up to this point, it served as the primary source of program information available to the field until Air Force Guidance Memorandum (AFGM) 2014-38-02 was published in December 2014. The playbook contained 15 volumes (A – O) arranged in broad groupings that provided an overview of program implementation, details of AFSO21 implementation strategy, descriptions of the CPI methodologies and associated tools, and a description of other resources that could be referenced to learn more. It was intended to be a living document and has been revised several times over its lifecycle with modifications published to different volumes once in 2008 (June) and three times in 2009 (June, August, and October).

Two years after the announcement of his intention to establish a DoD-wide CPI program DEPSECDEF England published DoD Directive 5010.42, *DoD-Wide Continuous Process*

Improvement (CPI)/Lean Six Sigma (LSS) Program, dated 15 May 2008. In this document, he outlined DoD policy regarding CPI/LSS as follows:

3. POLICY. It is DoD policy that:

a. The objective of the DoD CPI/LSS program is to strengthen joint operational Combatant Command and Military Department capabilities including making improvements in:

- (1) Productivity.*
- (2) Performance against mission (availability, reliability, cycle time, investment, and operating costs).*
- (3) Safety.*
- (4) Flexibility to meet DoD mission needs.*
- (5) Energy efficiency.*

b. CPI/LSS concepts and tools should be applied to benefit the full range of DoD organizations. These include combat, industrial, service, and office environments of headquarters, field, and operational organizations. The DoD Components should participate in defining, implementing, and sustaining CPI/LSS efforts. Each DoD Component should use CPI/LSS concepts and tools to improve the full range of processes and activities that comprise their operations, including decision-making processes and appropriate engagement with industrial base suppliers.

c. CPI/LSS programs shall be used to help meet organizational objectives. CPI/LSS methods, terminology, training plans, and other program elements may be adapted as required. Given diverse operational requirements, the DoD Components shall have full flexibility to identify CPI/LSS focus areas and training plans and may adapt other CPI/LSS program elements for their use.

d. Resource benefits resulting from CPI/LSS improvements in overall operating effectiveness may be retained by the DoD Components that generate them (Deputy Secretary of Defense Memorandum (Reference (c))). Effective management oversight should lead to reinvestment in additional CPI/LSS efforts, recapitalization, and further strengthening of operational capability.

To implement this policy, the directive assigned the following tasks to DoD Component Heads:

- (1) Ensure implementation of CPI/LSS policies consistent with this Directive and the guidance in Reference (c).*
- (2) Implement CPI/LSS programs to improve overall effectiveness and efficiency across missions and functions to gain the broadest possible range of organizational improvements.*

(3) Develop and implement appropriate education and training procedures and promote CPI/LSS career development opportunities, to include a CPI/LSS award and performance objective initiative as appropriate.

(4) Establish CPI/LSS education, training, and certification procedures consistent with DoD-wide guidelines and standards and include CPI/LSS in individual employee performance objectives as appropriate.

In response to speculation that the AFSO21 program would not survive “the impending senior Air Force leadership transition”, the AFSO21 program office issued a 19 June 2008 memorandum to quell these rumors.⁴⁰ The memo, entitled “Sustaining AFSO21”, proclaimed that “all Airmen need to know that AFSO21 will – and should – continue” and goes on to outline four main reasons why:

- 1. AFSO is part of a long history of USAF innovation. For over sixty years, front line innovation of Airmen has continuously strengthened mission capability. Engaging the ideas and initiative of our people is both necessary to our future success, and the right thing to do. We have a responsibility to make the absolute best use of our Airmen’s time, and to consistently improve the operational capability of this Air Force.*
- 2. The challenges in GWOT operations, demands on Airmen’s time, aging fleets, energy cost and security, and many other pressures remain. Resource availability forecasts continue to point to constraints. Against that backdrop, the need for finding efficiencies becomes even more imperative and AFSO provides a proven, common way to help deal with these shortages.*
- 3. Congress has directed OSD to implement business transformation efficiency programs across all of the military Services. This is embodied in both the standing directive on “Continuous Process Improvement” from DEPSECDEF, and recent Congressional requirements for a Chief Management Officer capability. AFSO is a core part of meeting these objectives.*
- 4. Initial direction from the transition teams and OSD indicates strong support for the overall goals and demonstrated progress of the AFSO program to date.*

The memo concludes that, as the result of “dedicated and focused efforts”, “AFSO is on a very steep vector and climbing” and “is now owned and led by Airmen across the Total Force.”⁴¹

On 14 November 2008, then AFRC/CC, Lt Gen Charles E. Stenner, signed out a memorandum to NAF and Wing Commanders and the HQ AFRC Limited Staff on the subject of “Optimizing Resources.” The thrust of the memo was to charge “Leaders at all levels” to “implement a culture that fosters innovation, encourages Airmen’s ideas and focuses process

improvement activities on eliminating waste and enhancing combat capability.”⁴² He challenged the addressees to “create better ways of doing business”, utilize external partnerships to “share successes” and “adopt [the] best practices of others.”⁴³ Additionally, he encouraged “commanders and directors to work in concert to institutionalize a deliberate process to maximize results throughout the Air Force.”⁴⁴

As a follow-up to Lt Gen Stenner’s “Optimizing Resources” memo, the AFRC directors of AFSO21 (A9) and Financial Management (FM) issued a dual signed memorandum, dated 25 November 2008, on the subject of a “Deliberate Process for Optimizing Resources.”⁴⁵ The memo reiterated the AFRC commander’s previous guidance and provided an attached “AFRC Innovation Process Flow Chart” describing the “Deliberate Process.”⁴⁶ The message and the process appear to be disjointed, however, as the memo indicates that “Wing/Group Commanders and Division Chiefs are expected to be the source of most of the initiatives, being closest to the day-to-day work” but it is not clear in the process flowchart where these inputs would be considered.⁴⁷

The Department of the Navy formally implemented the DoD Directive 5010.42 in its 15 May 2008 publication of SECNAV Instruction (SECNAVINST) 5220.14 on the subject of “Continuous Process Improvement (CPI).”⁴⁸ Its stated purpose was to establish “policy to institutionalize Continuous Process Improvement (CPI) as one of the primary enablers to manage the effectiveness and efficiency of Department of the Navy (DON) processes in support of the Department’s national defense mission.”⁴⁹ It outlined DON CPI policy as follows:⁵⁰

a. The primary purpose of CPI is to enhance warfighting capability and readiness. This is accomplished predominantly by improving the quality of support to the warfighter through improvements to core business operations processes that provide and sustain capability.

b. CPI is an intrinsic way of doing business that assists in the accomplishment of DON objectives and business plans through a focus on process management. To maximize overall benefits, CPI will be integrated with other management practices and transformation initiatives.

c. All members of the DON workforce are participants in the use of CPI methodologies, with emphasis placed on leaders and managers to ensure implementation.

d. Organizations within the Department of the Navy shall develop and sustain an organic manpower capability, including a cadre of trained, experienced personnel to deploy and apply CPI methodologies and tools. A common CPI knowledge baseline shall be developed and sustained. The Department of the Navy shall invest in the workforce by training, educating, and certifying employees on CPI methodologies and tools.

e. CPI not only applies to our internal core business processes but may also include external industry partners, such as the other Military Departments, Department of Defense, Federal agencies and industry, in their execution of support to those processes.

f. Organizations shall identify, prioritize, and execute CPI projects in alignment with DON and organizational goals and objectives. Improvement opportunities should focus on issues of priority and consider return on investment to ensure that leadership is embarking on projects that maximize the use of scarce resources.

g. CPI results shall be documented using the DON Continuous Process Improvement Management System (CPIMS) to measure progress and facilitate replication of process improvements and results.

h. Best practices will be communicated throughout the Department and subordinate commands. The appropriate methods as defined in the CPI/LSS communication strategy shall be used to provide transparency and the opportunity for replication of best business practices to achieve mission accomplishment and minimize redundant work.

In an 8 June 2009 memorandum to all USAF Commanders, the recently appointed SECAF, Michael B. Donley, and recently appointed CSAF, General Norton A. Schwartz, signaled their commitment to and support for the AF CPI program in a dual signed memorandum entitled “Air Force Smart Operations (AFSO21).”⁵¹ The memo contains the same general themes as the previous letters on this subject. Specifically that the AF “faces many constraints such as aging systems, increasing costs and dated processes”, that “AFSO21 represents a fundamental

transformation in how Airmen work”, and that process improvement “is the responsibility of leaders at all levels.”⁵²

On 17 July 2009, the DoD furthered its attempt to standardize CPI across the department by issuing DoD Instruction number 5010.43, *implementation and Management of the DoD-Wide Continuous Process Improvement/Lean Six Sigma (CPI/LSS) Program*. It extends the policy guidance contained in DoDD 5010.42 as follows:

4. POLICY. It is DoD policy that:

- a. Per Reference (d), all DoD Components shall implement CPI/LSS as an essential tool for improving the operating effectiveness of their organizations across the full range of operational, administrative, science and technology, and support functions.*
- b. CPI/LSS concepts, methodologies, and best practices shall be applied to assure cost effective management and the implementation of improved processes and new technologies throughout the Department of Defense.*
- c. Demonstrated performance improvements and results achieved as an outcome of CPI/LSS projects shall be documented and maintained in an automated, transparent fashion for purposes of management review, assessment, research, knowledge sharing, and historical reference.*
- d. DoD Components shall be permitted to retain savings and other financial benefits generated by CPI/LSS projects, unless explicitly directed to meet efficiency targets in accordance with DoD guidance.*

In similar fashion, the directive extended the tasks assigned to the DoD Component Heads:

- (1) Implement CPI/LSS policies consistent with Reference (d), this Instruction, and guidance approved by the DoD CPI SSC.*
- (2) Attain training and project targets described in Enclosure 2.*
- (3) Comply with the CPI/LSS procedures in Enclosure 3.*
- (4) Provide appropriate representation to the DoD CPI SSC (Enclosure 4) and its supporting bodies.*

While a precise timeline could not be constructed due to a lack of researchable documentation, it is common knowledge, within the CPI community, that sometime in the 2011 – 2012 timeframe, the AF decided to merge the wing level AFSO21 function with installation manpower offices as part of a larger strategy to comply with Resource Management Decision (RMD) 703, which required the AF to reduce and maintain civilian end strength at FY2010 levels. To find efficiencies, planning and programming personnel searched for redundancies within existing programs and determined that there was sufficient overlap in competencies required of AFSO21 facilitators and manpower personnel to justify transferring responsibility for the execution of the AFSO21 program to the installation manpower offices and cutting manpower authorizations assigned to local AFSO21 offices. Those wing commanders who had chosen to assign AFSO21 responsibilities as additional duties were not impacted by these cuts but those who had taken positions out of hide to man their AFSO21 offices with dedicated personnel lost manpower authorizations. In all, a total of 55 dedicated AFSO21 positions were lost to RMD 703 but the implications for the management of the program would extend far beyond the loss of dedicated personnel.

As a result of merging the AFSO21 program, which is functionally aligned to SAF/US(M), into the manpower function, which is functionally aligned to AF/A1M, a cross-functional dynamic in the management of the program was created. SAF/US(M) retained its functional authority to write policy guidance and provide program oversight while the AF manpower enterprise was assigned the responsibility to interpret and execute the program policy guidance produced by SAF/US(M). The merger introduced a new consideration in AFSO21 program management that would have to be addressed. In reassigning responsibility for program execution at the wing level from a special duty that can be assigned to anyone regardless of Air

Force Specialty (AFS) to a function that is an AF career field with its own unique Air Force Specialty Codes (AFSCs), the AF created a gap in training that would have to be addressed within the manpower functional community.

As the scope of this paper is focused on AF CPI program implementation within AFRC, it is necessary to point out that this change represents a divergence in how the active component and the reserve component implement the program from this point forward. To this day, AFRC program implementation remains largely unaffected by the merger. AFRC leadership has elected to maintain the status quo and keep its wing process managers organizationally aligned as direct reports of wing leadership. Even if AFRC leaders had elected to follow AF direction to merge, it would have had to overcome the fact that the manpower function in AFRC is centralized at the MAJCOM level – there are no local wing manpower offices within the command. Of course, the impacts of the merger did not leave the AFRC version of the program completely unscathed. Prior to the merger, active and reserve component organizational structures for program support were very similar and any program policy guidance issued to the field could be interpreted and followed equally effectively by both components. Post-merger the CPI program guidance issued by SAF/US(M) addresses the roles and responsibilities as they are found in the active component implementation of the CPI program. This led to confusion for AFRC units in that the guidance was not directly implementable as written without some creative interpretation at the local level or supplemental guidance from AFRC. This issue was apparently not a concern of the leadership of the AFRC CPI enterprise as no supplemental guidance of any kind has ever been issued to the field during the program's lifecycle to date.

In an interesting twist, the Office of the Secretary of the Navy issued a 28 May 2014 action memo approving the cancellation of SECNAVINST 5220.14. The justification provided

for this action was that it was “no longer required, as CPI is being performed at every level within the DON to support the Department’s national defense mission.”⁵³ This implies that DON leadership believes that it has successfully completed its Lean Six Sigma transformation and has institutionalized CPI across the Navy.⁵⁴ Unfortunately, the memo did not provide any proof of this assertion in the form of measured performance against established program goals set to indicate when institutionalization had occurred.

On 23 April 2014, SAF/US(M) released a memorandum on the subject of “Air Force Continuous Process Improvement Training.”⁵⁵ The message themes were similar to previous memos. Specifically that “leadership at all levels is critical to the effective implementation of continuous process improvement (CPI) principles throughout the Air Force” and how the “era of fiscal austerity” is continuing to present “significant challenges” to the “ability to make proper investments to modernize and sustain the capabilities of the Air Force.”⁵⁶ The bottom-line purpose of the memo was to promote the “CPI Senior Leader Course” and the “CPI Black Belt Course” as “mission critical training when resources are available to support attendance.”⁵⁷

Up to this point in time, the AFSO21 program was supported by a Management Information System (MIS) called the Continuous Process Improvement Management Tool (CPI-MT) which was based on a commercial-off-the-shelf application called Powersteering. This would soon change with the announcement in a 24 April 2014 memorandum issued by SAF/US(M)S, of a “New IT solution for Continuous Process Improvement Management Tool (CPI-MT).”⁵⁸ The memo instructed users to immediately cease inputting data into CPI-MT during preparation of the existing data for import into the new system.⁵⁹ The new system was to be developed in the SharePoint collaboration platform and was projected to be fielded by 31 August 2015.⁶⁰ By September the new system had been fielded under its current nomenclature –

the AF CPI Portal located online at the following Uniform Resource Locator (URL):

<https://cs3.eis.af.mil/sites/OO-TR-AF-43/cpi/Site%20Assets/Home.aspx>.

On 23 December 2014, SAF/US(M) issued an AFGM on *Air Force Smart Operations*.

AFGM 2014-38-02 is particularly significant in the history of AFSO21 as it represents the first official AF guidance ever published to the field concerning the AF CPI program. It promotes Air Force Smart Operations (AFSO) as the way to improve combat capability “across the Air Force while reducing associated costs.”⁶¹ It specified both a mission: “To create a process improvement mind-set” in our Airmen, and a vision for the program: “An Air Force in which the application of CPI is a way of life for all Airmen.”⁶² It assigned roles and responsibilities in accordance with the new organizational construct created by the manpower merger and did not contain any language addressing the AFRC unique implementation though it did contain language allowing for organizational variations involving the reporting structure of the MAJCOM Master Process Officer (MPO) and Wing Process Managers as approved by their respective commanders. This allowance for some flexibility in the assignment of roles and responsibilities was no accident. It was the result of a deliberate two-letter coordination of the draft AFGM with AFRC/A9 prior to publication. This ensured that the final published version would not create major conflicts with the AFRC program implementation right out of the gate.

It may also be worth noting that GMs expire after one year and in accordance with Air Force Instruction (AFI) 33-360, Table 4.1, Item 7, “OPRs must process and distribute a new or revised guidance publication incorporating the material before the GM expires.”⁶³ In the case of AFGM 2014-38-02, this did not happen according to the specified timeline and the publication expired once again leaving the AF CPI program without official policy guidance as has been the case for much of the program’s existence. As of this writing, the AF CPI program office has

communicated to the field that an Air Force Instruction has been coordinated and sent to publishing for an early April 2016 release.

On 9 January 2015, the AF Director of Manpower, Org and Resources (AF/A1), Brigadier General Richard M. Murphy, issued two memorandums to the field to announce the publication of AFGM 2014-38-02 and explain the manpower function's role in executing the AFSO program. The subject of the first memo was "Air Force Smart Operations Guidance Memorandum and Manpower" and it was directed to MAJCOM A1 offices. This memo explains that AFGM 2014-38-02 was "intended to close the current gap in AFSO continuous process improvement (CPI) guidance" and that AF/A1 "worked closely with SAF/US(M)S, Directorate of Transformation Outreach, the AFSO lead, on the AFGM to provide" more clarity and detail with regard to the roles and responsibilities of "commanders and the Manpower community as the frontline CPI practitioners."⁶⁴ The memo then goes on to specify the relationship between the AFSO program and the manpower community at both the MAJCOM and local levels.

At the MAJCOM level, the memo states that the AFGM "designates the MAJCOM/A1Ms as the command Master Process Owner (MPO)" but there are two problems with this statement. The first issue is a contextual one for the AFRC population as the memo suggests this is an absolute. What the AFGM actually states is that the "MAJCOM/A1 will be the primary office for the MPO unless this role has been otherwise appointed by the MAJCOM commander."⁶⁵ In the case of AFRC, A9 is designated the MPO role as specified in paragraph 5.12 of AFRC Mission Directive (AFRCMD) 1124, Organization and Functions of Headquarters Air Force Reserve Command.⁶⁶ Nevertheless, when this memo came out, it initially caused confusion within HQ AFRC between A1 and A9 regarding who would be responsible for the program going forward forcing the two directorates to seek clarification on its implications from

the AFRC/CC. The response was that AFRC/A9 would retain the MPO assignment in accordance with the guidance contained in the AFGM and AFRCMD 1124. The second issue concerns the proper usage of the MPO terminology. The memo defines an MPO as a “Master Process Owner” but the actual term is “Master Process Officer” as defined in the AFGM.⁶⁷

At the local level, the memo “identifies the installation/wing Manpower offices as the installation/wing Process Managers (WPM)” but again fails to address the broader context of “unless this role has been appointed otherwise by the installation/wing commander” that would be better understood by an AFRC audience.⁶⁸ The memo also contains paragraphs describing the historical connections between CPI and the manpower enterprise and discussing A1’s efforts to train members of the manpower community in order to “prime the pump to increase the number of AFSO trained Manpower practitioners to become the ‘go-to’ process improvement practitioners” for their organizations.⁶⁹ One final point of interest in this memo is the fact that it draws a connection between the AF CPI program and the DoD CPI program by offering access to an online CPI course known as the Gemba Academy which is used by DoD as part of their GB training program. This is particularly important as it represents at least a step towards standardizing the AF program with the rest of the DoD.

The subject of the second memo was “Air Force Smart Operations Guidance Memorandum and Your Manpower Office” and it was directed to installation and wing commanders. It contained, in more concise form, the same message as the MAJCOM version, but its primary purpose was to request installation and wing commander “support in championing this effort by communicating throughout your command support of the AFSO program and how your manpower office is there to facilitate your strategic alignment and process improvement efforts.”⁷⁰ For the same contextual reasons already identified in the

MAJCOM memo, this correspondence created confusion among AFRC wing and group commanders because it did not acknowledge the possibility that the WPM role may be assigned somewhere else in the organization as is the case for the AFRC implementation of the program.

On 11 May 2015, AFRC formalized WPM support to Wing and Independent Group commanders by publishing AFRC Manpower Standard (AFRCMS) 1010CO, *Wing/Group Process Manager*. This document was the culmination of a three month long study and validation of WPM workload and contains a detailed accounting of the major processes assigned to the WPM function as implemented in AFRC. It provides for a dedicated CPI position at every AFRC wing and independent group “to manage the Air Force Lean/Six Sigma and Air Force Lessons Learned Programs and work with subordinate units to build and maintain sufficient organic process improvement and lessons learned capacity across the organization in order to optimize the effectiveness and efficiency of key process and capitalize on the experiences and innovation of all Airmen.”⁷¹ At the direction of the AFRC/CC, geographically separated units (GSUs) were not included in the scope of the original manpower study. This has created a program management support gap for commanders of these units who must reach up to their assigned wing for CPI program management support. It also represents an additional workload for process managers of wings with subordinate GSUs. This was not a factor that was measured as part of the standard workload for the process manager function.

On 1 June 2015, SAF/US(M)S released a memorandum on the subject of “Standardization of AF CPI Green Belt Training.”⁷² The main purpose of the memo was to announce that “all previous versions of AF CPI GB Training materials [were] obsolete” and that “new/approved AF CPI Training Curriculum” would go into effect on 15 June 2015.⁷³ Additionally, it provided some insight into what the AF was doing to adjust active component

AF CPI operations to management by the installation manpower offices. Specifically, it highlighted efforts to “incorporate the Green Belt (GB) CPI curriculum into the 3S3 Manpower Apprentice Course” and “provide the latest GB training to over 550 additional manpower personnel throughout the Air Force.”⁷⁴

In a 17 July 2015 memorandum to MPOs and MAJCOM/A1Ms, the AF/A1M, Brigadier General Richard M. Murphy, and the SAF/US(M)S Director of Transformation, Colonel Dennis C. King Jr., proclaimed that “we have embarked on a journey to evolve Air Force Smart Operations (AFSO) into Air Force Continuous Process Improvement (CPI)” and announced the formation of a Strategic Partnership between the two organizations. The parameters of this partnership were that SAF/US(M)S would continue to be responsible for developing “CPI strategy, policy, and training” and enforcing standardization while AF/A1M would be responsible for “reshaping and revitalizing CPI skills throughout the Manpower community to strengthen and grow a trained CPI practitioner workforce across the Air Force Enterprise.”⁷⁵ Of particular interest is the characterization of the partnership as “highly efficient because it embodies non-manpower (and presumably non-dedicated) CPI practitioners and full-time Manpower-CPI practitioners at the installation, MAJCOM, and headquarters levels.”⁷⁶ The memo claims that this new “approach provides commanders flexibility and more CPI personnel to assist them in improving their units” with the ultimate goal of ensuring that “every unit at every level has trained and certified CPI practitioners.”⁷⁷ In reality, the concept of having full time CPI practitioners on staff to train other personnel is not new – it has been an element of the program since its inception. The only thing new about it is that the responsibilities to execute the program at the installation/wing level now belong to the manpower career field for the active component as opposed to a special duty appointee as is the case in AFRC.

On 29 October 2015, SAF/AA issued a memorandum “Establishing the Deputy Under Secretary of the Air Force (Management).”⁷⁸ The memo directs actions to create the subject office under the symbol of SAF/MG and transfer to it “all duties, responsibilities, and resources currently aligned to SAF/US(M)” effective 1 November 2015.⁷⁹ This action is significant because it impacts the nomenclature associated with the AF CPI program’s alignment to its program office.

In a 14 January 2016 correspondence on the subject of “Air Force Continuous Process Improvement (CPI) Execution Guidance Memorandum”, Brig Gen Murphy makes an appeal to installation and wing commanders to “leverage” their local manpower offices to “increase mission effectiveness” at their organizations through the use of CPI.⁸⁰ This memo explains that leadership focus is needed in order to “make CPI a priority” in an organization.⁸¹ It describes the installation/wing CPI program as a “team effort, fueled by collaboration...involving all CPI trained personnel.”⁸² The memo also clarified that the role of the manpower team is to “help build and manage this capability” and “the goal is to have select unit personnel trained in CPI” – not just the manpower personnel.⁸³ Unlike the previous two memos, this one acknowledges the possibility that the “Manpower Office (MO)” might not always be the “installation Wing Process Manager (WPM)” but it seems to largely negate this idea by using the terms MO and WPM synonymously throughout the document.⁸⁴ Brig Gen Murphy concludes with a challenge for commanders “to build a CPI culture at your installation” and “emphasize CPI as part of the Commander’s Duties and Responsibilities outlined in AFI 1-2.”⁸⁵

On 2 March 2016, the AFRC Commander, Lt Gen James F. Jackson, sent a memorandum to AFRC NAF and Wing Commanders on the subject of “Creating a Culture of Continuous Process Improvement (CPI) in AFRC.”⁸⁶ The memo opens with the same themes as many

previous AF CPI program memos indicating that “struggles for sufficient levels of funding, manning, and training” will continue for the foreseeable future and a cultural predilection for CPI promoted and led by commanders is critical to overcoming these difficulties.⁸⁷ It then makes the claim that “for years, AFRC has been a leader in CPI for the Air Force” but acknowledges the fact that no “formal tracking” of “CPI cultural transformation” had been implemented to measure CPI deployment progress in the field.⁸⁸ To address this shortcoming, the memo introduces its attachment, shown in Figure 2, called the “Framework for CPI Cultural Transformation.”⁸⁹ This document is essentially a graduated checklist that describes CPI cultural transformation as a four step process: Initiation; Integration; Full Implementation; Transformation.⁹⁰ It is promoted for commanders to use as a self-assessment tool to determine where they fall in the continuum of CPI cultural transformation but does not introduce any provisions to up-channel and aggregate any measurement data for analysis and reporting of the status of transformation maturity across the command. The memo concludes with Lt Gen Jackson’s direction for all wings “to complete stages one and two by 30 Sep 2016” but it is not clear how tracking of these completions will be accomplished as the units were not provided with specific reporting instructions to accomplish upon completion.⁹¹

Figure 2. AFRC Framework for CPI Cultural Transformation

| Framework for Continuous Process Improvement (CPI) Cultural Transformation | |
|---|---|
| Stage 1 Initiation | <ul style="list-style-type: none"> ○ Leadership commitment to CPI (e.g., CC commitment letter, messaging CC Call) ○ Identify best and brightest to train as CPI facilitators ○ Publish vision and mission statements and organizational goals ○ Conduct a strategic alignment event and maintain a strategic roadmap for CPI ○ Conduct an Enterprise Value Stream Analysis <ul style="list-style-type: none"> □ Identify suppliers, inputs, processes, outputs, and customers □ Identify core competencies and key, enabling, governing processes |
| Stage 2 Integration | <ul style="list-style-type: none"> ○ Generate baseline value stream maps of key processes ○ Establish method for management of organizational performance <ul style="list-style-type: none"> □ Institute key performance indicators (e.g., compliance, fiduciary, and readiness) □ Establish goals and battle rhythm for review of organizational metrics □ Conduct review of event actions plans to ensure implementation/sustainment |
| Stage 3 Full Implementation | <ul style="list-style-type: none"> ○ Develop plan to grow organic practitioners; aim for 5% GB & 1% BB of wing Airmen ○ Develop standard work <ul style="list-style-type: none"> □ Perform value stream analysis of all key processes □ Utilize 5S and visual management in work areas □ Cultivate cascading, strategically aligned metrics for operational/tactical levels □ Ensure work is level-loaded (i.e., evenly distributed & meets customer demand) |
| Stage 4 Transformation | <ul style="list-style-type: none"> ○ Sustain sufficient organic practitioner capability to facilitate problem solving ○ Continuously optimize value streams ○ Replicate innovation and share lessons learned <ul style="list-style-type: none"> □ Document efficiencies gained through CPI □ Benchmark, evaluate, and implement best practices from other organizations □ Share innovations and lessons learned across the enterprise (e.g., AFRC LLIB) |
| All Stages (Apply as necessary) | <ul style="list-style-type: none"> ○ Process manager tracking for GB certification NLT 18 months from date of assignment ○ Process manager tracking for BB certification NLT 36 months from date of assignment ○ Maintain appropriate level of CPI training for leadership cadre ○ If mission changes, refresh Enterprise Value Stream Analysis ○ Review alignment with NAF & MAJCOM strategy and refresh strategic CPI roadmap ○ Apply practical problem-solving model to: <ul style="list-style-type: none"> □ Performance gaps □ Capstone UEI or self-inspection findings □ Persistent problems (chronic or acute) |

Note: This framework is a guideline for implementing a CPI culture. It is not intended to be all inclusive. Nor is it intended for one to sequentially follow the steps within each stage. Transforming and establishing a culture is a complex endeavor that requires a multitude of efforts. This includes working CPI efforts that cross more than one stage.

Acronyms: (BB) Blackbelt, (GB) Greenbelt, (LLIB) Lessons Learned and Innovation Board

EVALUATION CRITERIA

AF CPI program effectiveness is measured along three different perspectives. The first perspective is the training and certification of CPI practitioners. It is important to acknowledge that these are not the only ways to measure CPI program effectiveness and may not be the best. It is more accurate to say that, with the program data that is produced and available for analysis, these are the only measures that are possible to make at this point. The training and certification

perspective measure is a quantification of how many members of a population have either met the requirements to be considered trained and/or certified. The resultant quantifications can be expressed as a fraction or as a percentage of a population and compared to a customer requirement or process standard. The second perspective is the quantification of how many AF senior leaders have received basic education in how to deploy CPI within their organizations. It is measured and expressed in much the same way as the training and certification perspective. The final perspective is a qualitative assessment of how well completed CPI projects meet the grading standards defined in the AF Practical Problem Solving Method (PPSM) evaluation rubric. Taken together, these three perspectives provide a more holistic picture of the effectiveness of the AF CPI program as implemented by AFRC.

RESULTS OF EVALUATIONS

CPI Practitioner Training and Certification

In order to conduct the study on the CPI training and certification aspects of the AFRC version of the AF CPI program, it was necessary to first decide what questions needed to be answered and then determine what data would need to be obtained and analyzed in order to derive the answers. Once the required data elements were determined, it was then necessary to identify the correct data source for each one. It is also important to understand that these questions can be grouped according to the types of data needed to answer them. The two general categories are Manpower data and Training data. The manpower data used for this study was obtained from the MPES system as the result of a query written to extract a copy of the AFRC Unit Manpower Document (UMD) into an excel spreadsheet for further manipulation. The CPI training data for the AFRC population has two distinct sources: the AF CPI Portal and the AFRC/A9R CPI training database. The AF CPI Portal is considered the system of record for all

AF CPI training data. As the AF CPI Portal is not a very robust application and lacks the data integrity needed to support program analysis at the MAJCOM level, AFRC/A9R decided to develop its own data collection database to house AFRC CPI training data. While it offers a marginal improvement over the data capabilities of the AF CPI Portal, it suffers from a lack of data integrity as well due to the fact that the training data is not always input as the result of program management processes but sometimes after the fact as data is manually collected by AFRC/A9R personnel. The study will answer the training questions using each source individually and then compare the results to illustrate how well the systems track each other.

In the Manpower category, the following questions must be answered:

- *How many Full Time manpower authorizations exist in AFRC?*
- *How many Part Time manpower authorizations exist in AFRC*
- *What is the total number of manpower authorizations in AFRC?*

Manipulating the data extract resulting from the aforementioned query to quantify full time, part time and the total number of manpower positions is fairly straightforward but there is a nuance one must consider that is unique to the AFRC population. Specifically, it is the fact that it is possible for a single individual to encumber more than one position on the AFRC UMD. This is so because it is possible for an individual to both be a civilian employee of AFRC while simultaneously being a reserve military member. This condition manifests itself in two ways.

The first and most common situation is when the member is an Air Reserve Technician (ART) which requires the individual to occupy a linked pair of civilian and military positions as a condition of appointment. The second and less prevalent way is when a civilian employee is also a reserve military member outside of the ART program. The major difference is that appointment to an ART position requires the member to occupy both the full time and part time halves of the linked pair. In the non-ART employment situation, the member's full time civilian employment

and part time military employment are completely independent of each other. Because of this, computing the total population of AFRC is not a simple matter of adding the full time and part time positions. It requires the quantification of all positions paired as a result of the ART program and subtracting half of them from the summation of the full time and part time positions to produce a figure that more accurately represents the total number of manpower positions in AFRC. The final preparation of the data required adding another column/data element called “POS_TYPE” to indicate the status of each position as either “FULL TIME” or “PART TIME” and then creating a pivot table to summarize and stratify the data by POS_TYPE. The final result is as follows:

- *20166 full time manpower authorizations.*
- *69213 part time manpower authorizations.*
- *A grand total of 76306 manpower positions.*

In the Training category, the following questions must be answered:

- *How many AFRC Full Time personnel have received GB training?*
- *How many AFRC Full Time personnel have received GB Certification?*
- *How many AFRC Part Time personnel have received GB training?*
- *How many AFRC Part Time personnel have received GB Certification?*
- *How many AFRC Full Time personnel have received BB training?*
- *How many AFRC Full Time personnel have received BB certification?*
- *How many AFRC Part Time personnel have received BB training?*
- *How many AFRC Part Time personnel have received BB certification?*

Deriving the answers to these questions was not as straightforward as was the process used to quantify manpower authorizations. The analysis involved querying data from two separate systems and manipulating each data set into a tabular form that could then be transformed into pivot tables to provide both the AF as well as the AFRC answers to the questions. For the AF CPI Portal data set, an assumption had to be made to ensure a true “apples-to-apples”

comparison between the results obtained from the independent analyses of the data extracted from the AF CPI Portal and the AFRC/A9R database. The reason for this is primarily due to the fact that the definition of what it means to be a trained CPI practitioner has never been adequately defined in any DoD or AF level CPI guidance to date. Specifically, the difference between a trained and a certified AF CPI facilitator is not explained in sufficient detail to make it possible to clearly distinguish how the training provided to a trainee differs from the training provided to someone who has had certification conferred upon them. With the information currently available, it is possible to assume one of two things regarding AF CPI training and certification: 1. A CPI trained individual is one who has attended the required academics course only while a CPI certified individual has attended the academics course, completed the required course of practical instruction under the supervision of a CPI mentor and has been awarded certification, or 2. Both trainees and certified individuals have received exactly the same academics and practical instruction but not all of them were submitted or approved for certification. The second assumption seems a less plausible scenario from an AF as well as an individual perspective as it makes little sense for someone to receive all of the training and do all of the practical work required for certification only to not take the final step and submit for certification. On the other hand, since the word training implies a practical element, it would also seem a stretch to call someone who had only attended an academics course a “CPI trained” individual. As mentioned during the background review, DoDI 5010.43, enclosure 2, provides “Training and Project Targets” but stopped short of setting CPI certification goals instead deferring to DoD components to establish their own targets.⁹² As for AF level guidance, the now expired AFGM 2014-38-02 addressed this, in paragraph 4.2.4., by stating that “The Director, Transformation Outreach (SAF/US(M)S) will develop requirements and standards for AFSO CPI

education, training, and certification.”⁹³ None of these publications ever made a significant distinction between trained and certified CPI practitioners and during the lifespan of AFGM 2014-38-02, no additional guidance was ever published to address or clarify this issue though one can hope that it will be covered in the highly anticipated (by some) AF Instruction on the AF CPI program due to be published in April 2016. As this research is focused on AFRC program implementation, it seems prudent to default to the same assumption upheld by AFRC/A9 until such time as there is more specific information available regarding the difference between “CPI Trained” and “CPI Certified.” Currently, AFRC/A9 considers an individual to be GB or BB trained if they have attended the commensurate academics course.

The AF CPI Portal maintains CPI practitioner records in a SharePoint list data structure. For each individual, it contains data elements to indicate the CPI proficiency level (GB or BB), the date that the individual attended the commensurate academics course, and the date that certification was conferred. These three data elements were used to categorize individual practitioners as follows:

- GB level with no certification date = GB Trained
- GB level with certification date = GB Certified
- BB level with no certification date = BB Trained
- BB level with certification date = BB Certified

By comparison, the AFRC CPI Training database maintains data elements to track the dates when academics courses were completed and certifications were conferred for each individual practitioner in the AFRC population. It automatically calculates the correct training status category based on the data that is populated as follows:

- GB academics only = GB Trainee
- GB certification date = GB Certified
- BB Academics date = BB Trainee
- BB certification date = BB Certified

The major difference in the record keeping schemas of these two systems is that while the AF CPI Portal only seems to retain information related to the current level of training/certification, the AFRC CPI training database retains a historical record of each practitioner's training accomplishments. Fortunately, the data elements available in both systems are compatible with the selected assumption about how to define a trained CPI practitioner. It is worth noting that the data housed in either system would not be sufficient for the other scenario where the only difference between a CPI trained individual and a CPI certified one is the certificate. Neither system currently tracks the individual practical milestones for participation in the minimum number of qualifying CPI projects required for certification.

A final issue that must be explored before discussing the analysis is the stratification of the population into full time and part time components in addition to the total. The CPI training targets “provided to DoD Components” as published in DoDI 5010.43, Enclosure 2, Paragraph 2, specifies: “a. At least 1 percent of an organization’s *total onboard population* (emphasis added) shall be trained as Lean Six Sigma Black Belts” and “b. At least 5 percent of an organization’s *total onboard population* (emphasis added) shall be trained as Lean Six Sigma Green Belts.”⁹⁴ The issue with the phrase “total onboard population” is in how to interpret its implications for a population that is predominantly a part time work force.⁹⁵ Whereas the active component of the AF is a full time military and civilian workforce, only 26 percent of the Air Force Reserve Command is full time and consists primarily of civilians (including military technicians in civilian status). This presents an ambiguity that, until clarified in policy, leaves a choice between two assumptions. Specifically, do the DoD (or AF) training standards apply to the entire AFRC population or just the portion that is full time? Initially, it might not seem ambiguous as it seems reasonable to take it at face value and assume the standard applies to the entire population. Upon

further scrutiny, one could reason that because the DoD training standards impose a workload on the implementing organizations, the available man hours to accomplish the work becomes a factor that must be considered. The only part of the AFRC population that directly compares to the active component workforce is the 26 percent that is full time. This consideration would seem to make it more plausible that compliance with the DoD standard should be borne only by the full time component of the AFRC population. Additionally, this scenario would have the added benefit of creating training workload parity between the active and reserve components and would equalize program performance comparisons between AFRC and its sister MAJCOMs. Unfortunately, to date, no program guidance has been published that clarifies this issue. This issue has been discussed numerous times within the HQ AFRC/A9 directorate but was never resolved conclusively enough to codify a policy position but, for most of the program's life cycle to date, A9 senior leadership has consistently expressed a preference for measuring performance against the DoD targets using the full time population. For that reason, the full time population figures will be the primary focus of this research project.

The results of the analysis of CPI training and certification are presented in Table 1 below. The table is structured to present the system of record (AF CPI Portal) point of view in the first (green) band, the AFRC/A9R training database point of view in the second (blue) band, and the difference or delta of the AFRC figures from the system of record figures in the third (yellow) band. The positive deltas in all but one data point indicate that the AFRC database contains records for more practitioners across the command than are accounted for in the AF CPI Portal. While a further investigation is beyond the scope of this research, this suggests that a significant portion of the AFRC population is not consistently using the AF system of record to capture CPI practitioner data. Additionally, since the AFRC program office maintains its own

data to from which to derive key measures for program analysis, it may not perceive a critical need to advocate to the chain of command for the enforcement of the use of the AF system of record.

Table 1. Results of the Quantification and Comparison of CPI Practitioner Training Data

| AIR FORCE RESERVE COMMAND AF CPI PRACTITIONER TRAINING SNAPSHOT FOR MARCH 2016 | | | | | | | | | | | | |
|--|---------------------|---------------------|-----------------------------------|-----------------------------------|------------|--------------|----------|--------------------|------------|--------------|----------|--------------------|
| Data Source | Population Category | Authorized Manpower | 5% of Authorized (DOD Std for GB) | 1% of Authorized (DOD Std for BB) | GB Trained | GB Certified | GB Total | Percent GB Trained | BB Trained | BB Certified | BB Total | Percent BB Trained |
| AF CPI PORTAL | FULL TIME | 20166 | 1008 | 202 | 296 | 47 | 343 | 1.70% | 19 | 14 | 33 | 0.16% |
| | PART TIME | 69213 | 3461 | 692 | 224 | 11 | 235 | 0.34% | 3 | 6 | 9 | 0.01% |
| | TOTAL | 76306 | 3815 | 763 | 520 | 58 | 578 | 0.76% | 22 | 20 | 42 | 0.06% |
| AFRC CPI TRAINING DB | FULL TIME | 20166 | 1008 | 202 | 506 | 74 | 580 | 2.88% | 30 | 22 | 52 | 0.26% |
| | PART TIME | 69213 | 3461 | 692 | 270 | 10 | 280 | 0.40% | 5 | 7 | 12 | 0.02% |
| | TOTAL | 76306 | 3815 | 763 | 776 | 84 | 860 | 1.13% | 35 | 29 | 64 | 0.08% |
| AFRC DELTA | FULL TIME | 0 | 0 | 0 | 210 | 27 | 237 | 1.18% | 11 | 8 | 19 | 0.09% |
| | PART TIME | 0 | 0 | 0 | 46 | -1 | 45 | 0.07% | 2 | 1 | 3 | 0.00% |
| | TOTAL | 0 | 0 | 0 | 256 | 26 | 282 | 0.37% | 13 | 9 | 22 | 0.03% |

Note: Civilian authorizations linked to Air Reserve Technician (ART) positions subtracted from Total Authorized Manpower figures (highlighted in red text) to prevent duplicate counting errors.

The comparison of results from each dataset shows the proportion of trained personnel is larger in the full time component of the AFRC population and this is consistent between the AF CPI Portal and the AFRC CPI training database. The two probable reasons for this are that the full time population has more available time to participate in CPI training or that the AFRC CPI program implementation favors training individuals from the full time population. While there are no data available to determine a correlation between each of these variables and the results measured, it is reasonable to assume that both are contributing factors.

In terms of performance over time, the available training and certification data doesn't provide enough detail to support measuring backwards in time. Assuming constant growth rates, it is possible to extrapolate backwards to estimate growth rate over the life cycle of the program thus far and trend forward along the timeline to ascertain the point in the future when the GB and BB standards might be reached. Figures 1 and 2 graphically illustrate this idea. The results of these analyses suggest that AFRC will reach the DoD targets for trained GBs by March 2024 and trained BBs by March 2044. In other words, AFRC is still 8 years away from meeting the GB standard of 5 percent and 28 years away from meeting the BB standard of 1 percent. This

disparity between the GB and BB trained population growth rates is likely explained by the fact that the availability of BB academics courses is very limited in comparison to GB academics course offerings which can be instructed by certified Black Belts in the field. The BB academics course is only offered a few times per year at the Air University's Eaker Center at Maxwell AFB and AFRC personnel must compete with each other as well as active component personnel to get class assignments.

Figure 3. Extrapolation of GB Trained Growth Rate in AFRC Full Time Population

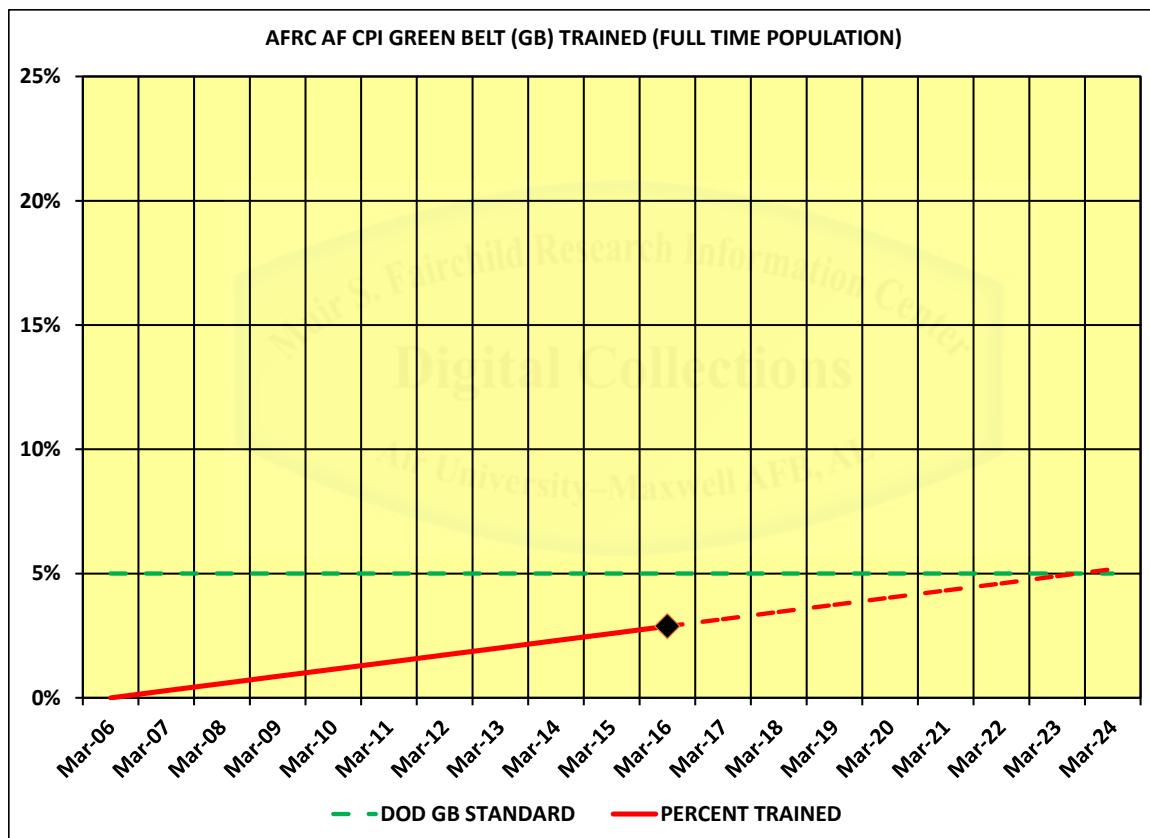
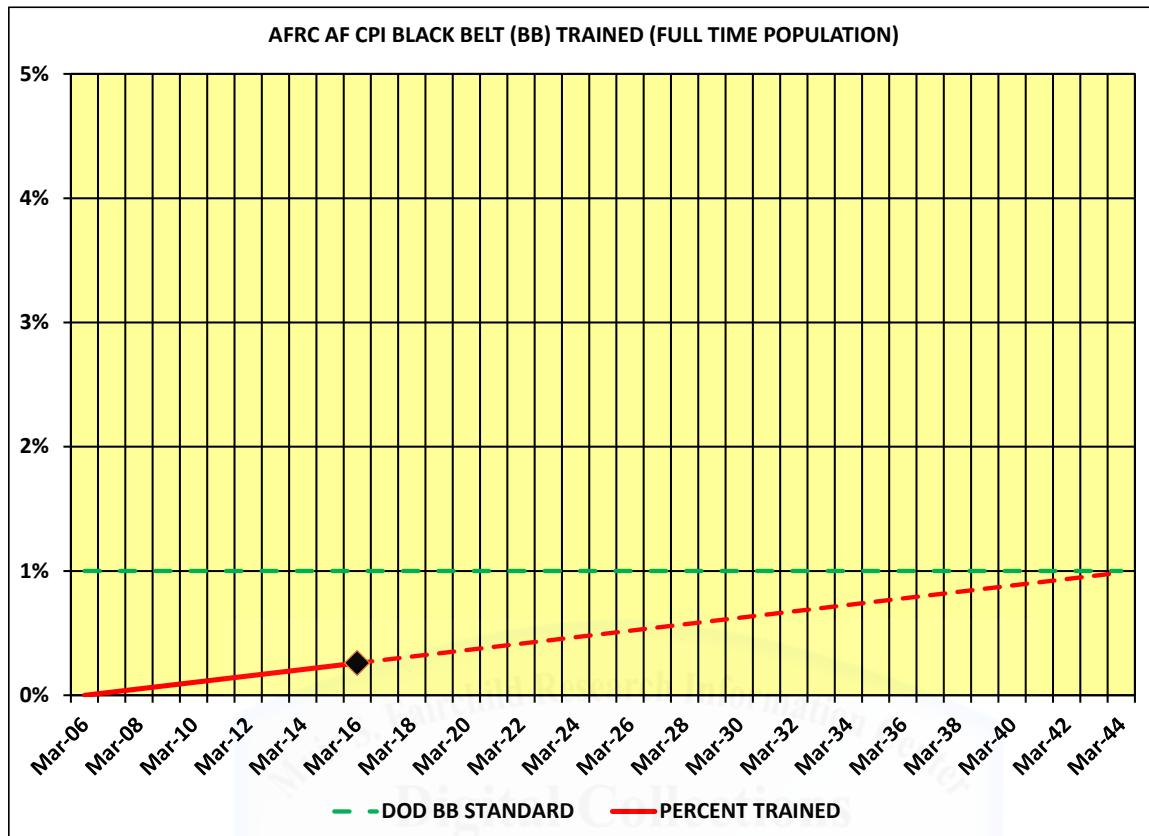


Figure 4. Extrapolation of BB Trained Growth Rate in AFRC Full Time Population



CPI Senior Leader Education

According to the AFSO21 Playbook, the AF CPI Senior Leader Course (SLC) is an awareness course of instruction for individuals in the grades of O-6, GS-15, and E-9 designed to “provide introductory knowledge of how to lead a lean enterprise.”⁹⁶ AFGM 2014-38-01 describes the course as being “designed to equip senior leaders to define problems; measure, manage, and monitor performance; and strategically align organizational goals, objectives, and project selection using CPI tools.”⁹⁷ Manipulating the dataset used to determine the number of manpower authorizations for the previous analysis, it was possible to quantify the number of authorized senior leader positions in AFRC by adjusting the spreadsheet filters to select only those positions with the target authorized grade. The technique used to stratify the resulting

population into full and part time segments remained the same. Senior Leader Course attendance data was available in both the AF and AFRC data sources but the data contained in the AF CPI Portal was in the form of an excel spreadsheet containing the details of every individual that had ever attended an SLC since AF CPI program inception (5923 records). The issue that had to be overcome in order to make a meaningful comparison between the two data sources was that it would be necessary to identify which names on the AF CPI Portal listing were current members of the AFRC senior leader population. In order to achieve this, it was necessary to establish a common data element, or key field, to be used to link records from the AFRC database to records from the AF spreadsheet. As the only common data fields between the two systems were individual last and first names, a key field composed of the last name concatenated with the first name was added to a copy of the AF CPI spreadsheet. Another issue that had to be resolved with the AF data set was the fact that it contained duplicate records on individuals who had attended the SLC more than one time. This was easily fixed using Excel's "Remove Duplicates" data tool on the key column. Upon completion, the tool reported that it had removed 323 duplicate values leaving 5600 unique records. In the interest of maintaining the strictest possible data integrity, it is necessary to point out that the techniques used to prepare the AF data could have resulted in a valid record being eliminated in the case where two senior leader have the same first and last names. As the senior leader population is such a small portion of the total population, any errors introduced by this issue would be negligible in the final analysis but to mitigate this possibility, the list was alphabetized and manually scanned for valid duplicates before the remove duplicates tool was run. Once the AF dataset was finalized, it was imported as a table into a copy of the AFRC CPI training database. Within the AFRC database, a query was created to select all of the current senior leaders from the population and add the key field needed to link the result with the

AF data table. Using relational database techniques, another query was created to link (or relate) the AFRC senior leader data query with the AF data table using the common key field. The resultant product of this final query was a list of all AFRC senior leaders with corresponding AF SLC attendance data where the key from records in the AF data table matched the key from records in the AFRC senior leader query. These records were then copied to an excel spreadsheet for a final scrub to remove any mismatches that might have been caused by the identical name issue mentioned earlier. After the scrub was completed and mismatches were removed, the spreadsheet was converted into a pivot table and set up to tabulate the final counts of how many AFRC senior leaders have attended SLC stratified by population type and total compared between the AF and AFRC positions. It is worth mentioning here that most of the intensive data manipulation required to transform the AF data into a form suitable for analysis could have been avoided had the individual records been tagged with a standard universal key, common to both data sources, that uniquely identified each member, such as the social security number (SSN).

The results of the comparison of CPI senior leader course attendance are presented in Table 2 below. As in the previous analysis, the green band depicts the system of record view, the blue band represents the AFRC position and the yellow band shows the AFRC delta from the AF figures. The differences are significant but not unexpected. This is because the AFRC database updates its records from manpower and personnel systems of record on a monthly basis where the AF CPI Portal SLC spreadsheet is never updated except to add more records of SLC attendance. It makes no attempt to maintain the status of the individuals listed and in that sense, it is more of a historical record than a living database. It is worth noting that this analysis would have been cost prohibitive for the AFRC population with only the AF dataset to work with as there is no way to know which listed individuals are part of the current AFRC senior leader

population without many painstaking hours of matching the individual records from each system manually. It was only by merging data from both sources together that it was possible to quantify, within an acceptable margin of error, how many AFRC senior leaders have attended SLC as far as the AF is concerned in a reasonable amount of time.

Table 2. Results of the Quantification and Comparison of CPI Senior Leader Course Data

| AIR FORCE RESERVE COMMAND AF CPI SENIOR LEADER COURSE ATTENDANCE SNAPSHOT FOR MARCH 2016 | | | | |
|--|-------------------|---------------------------|---------------------------|------------------|
| DATA SOURCE | POSITION CATEGORY | AUTHORIZED SENIOR LEADERS | ATTENDED AF CPI SL COURSE | PERCENT COMPLETE |
| AF CPI PORTAL | FULL TIME | 779 | 205 | 26.32% |
| | PART TIME | 1635 | 164 | 10.03% |
| | TOTAL | 2353 | 369 | 15.68% |
| AFRC CPI TRAINING DB | FULL TIME | 779 | 309 | 39.67% |
| | PART TIME | 1635 | 196 | 11.99% |
| | TOTAL | 2353 | 505 | 21.46% |
| AFRC DELTA | FULL TIME | 0 | 104 | 13.35% |
| | PART TIME | 0 | 32 | 1.96% |
| | TOTAL | 0 | 136 | 5.78% |

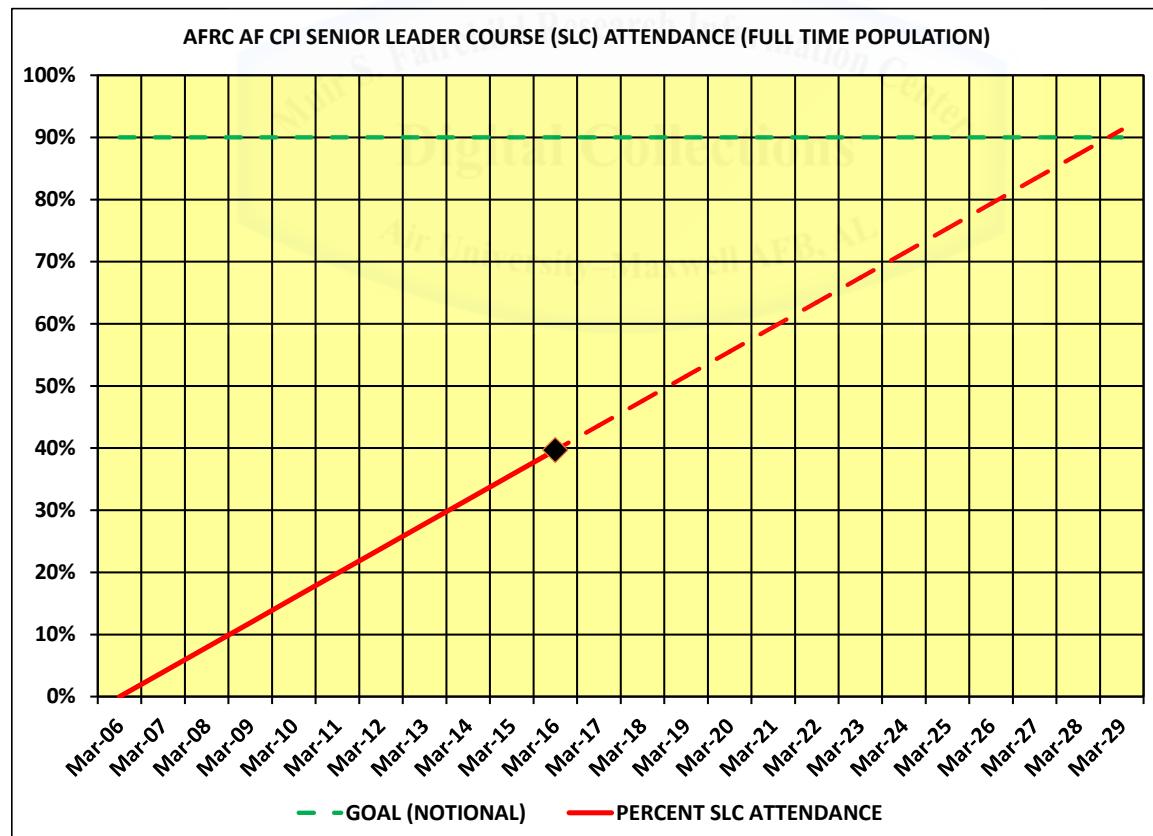
Note: Civilian authorizations linked to Air Reserve Technician (ART) positions subtracted from Total Authorized Manpower figures (highlighted in red text) to prevent duplicate counting errors.

The comparison of the results reveals that the proportion of senior leaders that have attended SLC is larger in the full time component of the AFRC population just as it was for CPI practitioner training. As before, it is also possible to reason that this is because the full time population has more available time to participate in the training or that the AFRC CPI program favors training full time personnel or both. There are no defined SLC attendance targets or standards against which to measure actual performance but AFGM 2014-38-02 does state that “all Colonels, GS-15s, and Chief Master Sergeants *should* (emphasis added) attend the Senior Leadership Course.”⁹⁸ As 100 percent is likely not an attainable goal due to the normal attrition of the population over time, it might be a more realistic option to calculate the average expected performance to be 100 percent minus the average attrition rate of senior leader positions. For example, if the average attrition rate of AFRC senior leader positions was 10 percent, applying the formula described above would yield more realistic a 90% goal of senior leader attendance at SLC. In terms of applicability to full and part time portions of the population, the guidance contained in AFGM 2014-38-02 is not ambiguous and clearly applies to both. However, since

the AFGM has expired and is not currently in force, it seemed reasonable to focus on the full time component of the population for the purposes of this research in order to maintain parity with the CPI practitioner analysis.

In terms of performance over time, the SLC data in hand doesn't provide enough detail to support measurements very far in the past but it is possible to extrapolate backwards to estimate growth rate over the life cycle of the program thus far and trend forward along the timeline to ascertain the point in the future when the goal might be reached. Figure 1 graphically illustrates the result and predicts that 90 percent of the full time senior leader population will have attended SLC by March of 2029 – 13 years from now.

Figure 5. Extrapolation of SLC Attendance Growth Rate in AFRC Full Time Population



CPI Projects

In both the AF and AFRC implementations of the AF CPI program, evaluating CPI projects in terms of Return on Investment (ROI), cost savings, or cost avoidance doesn't seem to have found much utility. The AFSO21 Playbook, Volume I, contains detailed instructions on how to use an excel tool called the "Financial Reporting Template." and an Access tool, introduced in August 2009, called the "Financial Management Template."⁹⁹ These applications were intended to be used as cost-benefit analysis tools designed to assess the financial impacts and implications of process changes recommended by a CPI initiatives in order to develop proper business cases for the proposed changes when certain dollar thresholds would be exceeded.¹⁰⁰ As the thresholds were all in excess of one million dollars, mandatory use of these tools to estimate returns would have been rare. On the other hand, using them for less impactful events would have been a way to capture the data necessary to estimate returns generated by any event. During the course of this research, no evidence was found to suggest any AFRC CPI projects included the use of the financial template tools to quantify resource data associated with the implementation of process improvement countermeasures. Additionally, it would be an exhaustive and expensive effort to attempt to analyze past project documentation to find the necessary data to estimate their anticipated financial impacts. For these reasons, it is not practical to estimate ROI or financial impacts over the life of the AFRC CPI program to date within the scope of this research project. In another development, the AF CPI program office published a document to the AF CPI Portal advertising changes to the program lexicon as an addendum to the PPSM course material.¹⁰¹ The document indicates that all references to the FM Tools have been deleted from the training material which suggests that the AF has abandoned their use.¹⁰²

To evaluate CPI projects for effectiveness, AFRC uses the AF PPSM certification project evaluation rubric as part of a board process to determine if certification requirements have been met by individual applicants for GB and BB certification. The grading rubric consists of 31 questions evaluated on a 1 – 9 Likert scale stratified as follows:

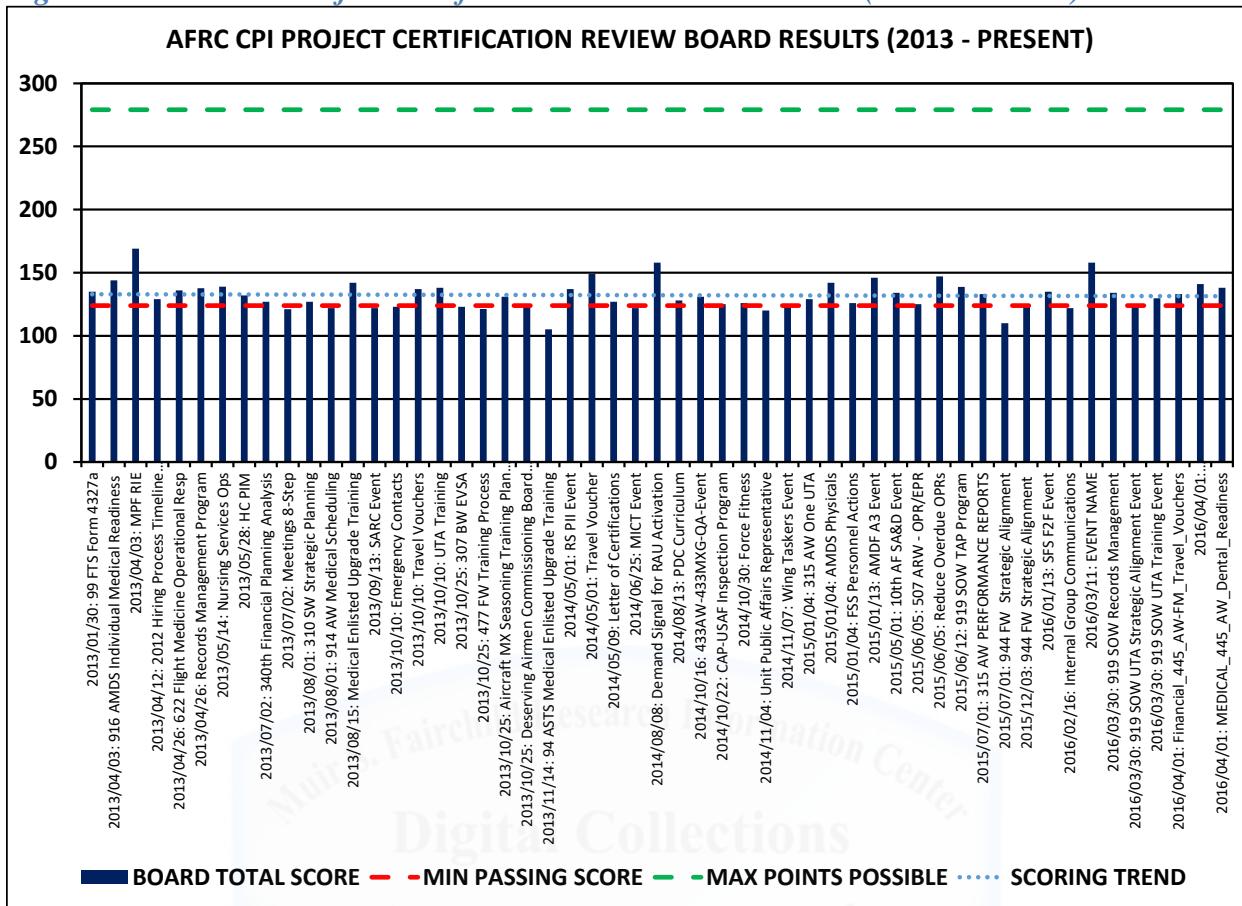
- 1-3 = Does Not Meet
- 4-6 = Meets
- 7-9 = Exceeds

The questions are designed to evaluate how well each individual step in the PPSM for the project being evaluated met the rubric criteria for successful execution. The individual question scores are then totaled to produce an overall score. As 4 is the lowest score in the “Meets” range, the minimum passing total score is 124 (4 X 31). Similarly, the highest possible total score computes to 279 (9 X 31). Additionally, it is important to mention that only CPI projects submitted by individuals seeking certification are subjected to this grading process. This means that not all of the projects uploaded into the system of record (AF CPI Portal) documentation repository will have been evaluated for effectiveness. Furthermore, the AF CPI Portal does not contain any records of the evaluations in individual CPI projects. To get the raw data sample required to evaluate how well AFRC CPI projects meet the rubric effectiveness requirements, copies of previous certification review board score sheets, in the form of individual Excel workbooks, were obtained from archived files maintained in the AFRC program office for the date range of January 2013 to the present. The search produced 53 individual Excel files each containing trainee and project details as well as the board scores for each rubric question. To merge the required data into one spreadsheet for analysis, a visual basic subroutine was written to parse through the directory containing these files and extract the required data from each one, reassemble this data as individual records, and copy these records to a new worksheet. Once the

target worksheet was populated with the data from all of the individual score workbooks, it was transformed into a pivot table for final analysis.

For the final analytical product, a combination bar and line chart was constructed to visualize the dataset provided by the pivot table. As depicted in Figure 4, the project board score totals were ordered by the date they were reviewed by the AFRC certification board (oldest to newest) and plotted as bars along the X-axis. The minimum passing score was plotted as a red dashed line and the maximum score was plotted as a green dashed line. Finally, a trend line was added to show the average trending of the score totals over the time segment represented by the sample data. Viewing the data in this manner clearly shows that the mean CPI project board score is consistently just a few points above the minimum passing score with no noticeable trend in either a positive or negative direction. This would suggest that most instances of CPI projects using the PPSM as practiced by AFRC CPI practitioners in training are consistently barely meeting the minimum standard for effective problem solving. Additionally, while it is reasonable to assert that the training and mentoring process that is producing these results has not made any significant improvements in the quality of instruction provided to CPI trainees in the past three plus years as reflected by the trend. In other words, there is significant room for improvement in the quality and capabilities of the certified CPI practitioners being produced by the AFRC program.

Figure 6. AFRC CPI Project Certification Review Board Results (2013 – Present)



RECOMMENDATIONS

Based on the results of these analyses, AFRC should consider taking the following actions to address the issues highlighted by this research:

1. Develop and publish GB/BB CPI practitioner training targets (standards) including applicability to population segments
2. Develop and publish GB/BB Certification targets (standards) including applicability to population segments
3. Develop and publish Senior Leader Course attendance targets (standards)
4. Commanders at all levels should measure, monitor and track progress towards meeting published targets
5. Perform root cause analysis on the CPI training program and determine countermeasures to improve the effectiveness of the CPI projects facilitated by its practitioners
6. Develop and publish a data collection template to capture required data elements needed to compute ROI for CPI projects and mandate its use for all projects

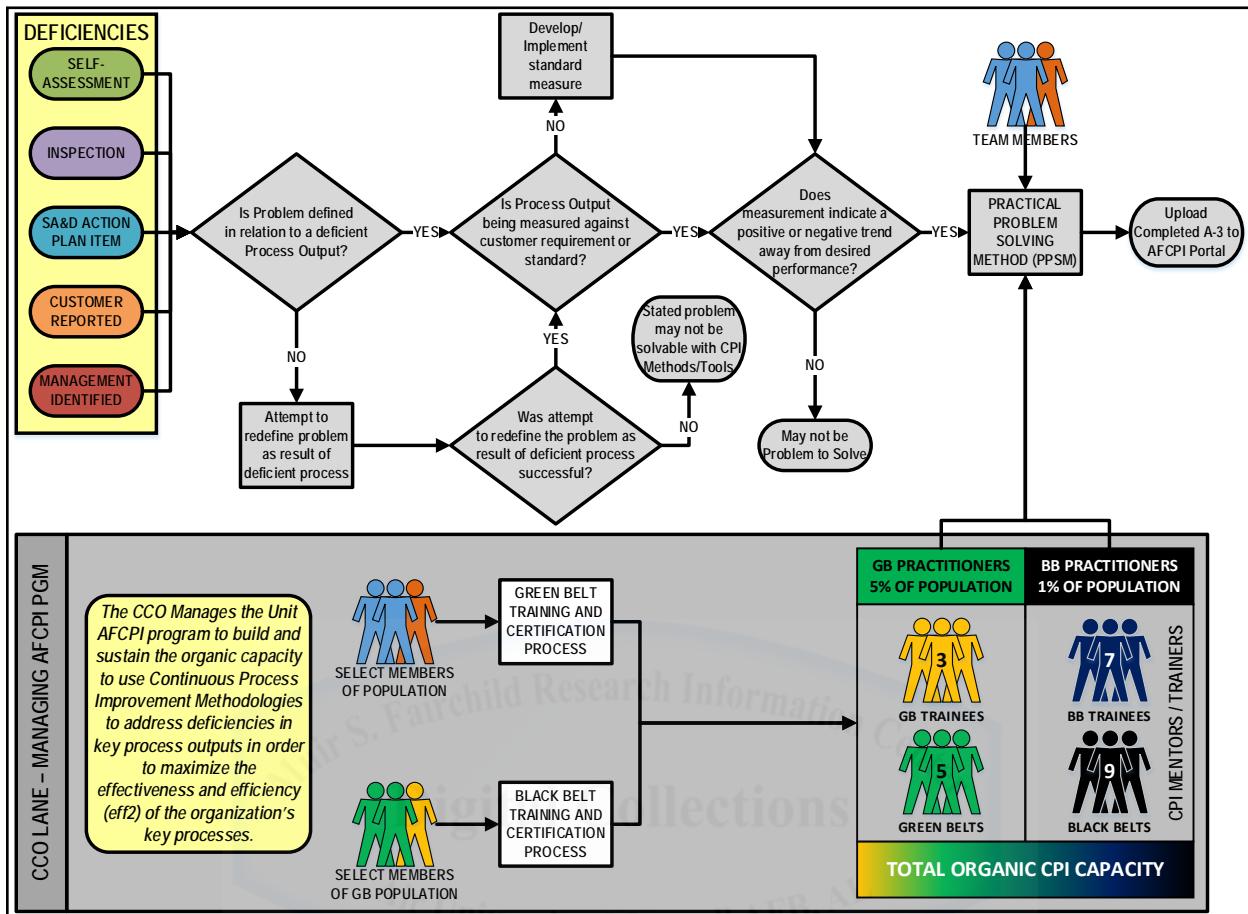
7. Establish a recurring feedback mechanism to collect customer satisfaction data from wing/group commanders of units with process manager billets to collaboratively manage the training and certification of individuals assigned to these positions
8. Ensure that support for the AF CPI program is a consideration used when making performance evaluations, promotion recommendations or assignments to key leadership positions

It is very difficult, if not impossible, to manage something that isn't visible. Measuring key aspects of performance against a customer requirement or standard provides the visibility necessary to enable leaders to effectively manage. Managing without first establishing the level of visibility required to know and understand what is happening with a process or program, is tantamount to driving in the dark without headlights. These recommendations are all intended to address gaps in program performance from this point of view.

A recurring theme that was seen throughout the background analysis was the fact that the AF CPI program is a commander's program and must be led from the front in order to be effective. The aspect of program performance measured and analyzed in this research suggests that leaders are not engaged or possibly don't feel any ownership of the AF CPI program. This is not surprising when one considers the scarcity of actual program guidance throughout the life of the program to date. Anecdotally, commanders don't seem to have a solid and consistent understanding of what the process managers are supposed to be doing for their units. Many commanders believe that the process manager function should be subordinated to the inspection and compliance function to create an organizational element that finds and then fixes readiness and compliance deficiencies. This suggests that the wing and group commanders who supervise process managers regard them as their only source of CPI practitioner capacity and utilize them as such. The reality of the situation is a much different picture. Figure 7 depicts a simplified overview of the AF CPI program as it is intended to function. The general idea is that the PPSM, being the core AF problem solving process, requires three inputs to function properly: a process

oriented problem, a team of experts on that process, and a trained CPI facilitator. As shown in the flowchart, the process manager, or CCO, should primarily be concerned with managing the processes that train and certify unit members as GB and BB practitioners to ensure sufficient organic CPI capability exists to meet the problem solving demands of the their assigned units. Commanders should act to identify individuals within their organizations that have an aptitude for the rigors of CPI problem solving and appoint them to receive formal CPI training to serve as part time CPI practitioners in their areas of expertise when needed. This organic capability is represented across a unit as a pool of CPI trained personnel at various stages of competency and proficiency. This can been seen on the chart as the total organic capacity of the unit. The chart shows a combination of GB/BB trainees and certified GB/BBs. The number shown on each figure in the block represents an analogy to enlisted AFSC skill levels to illustrate relative levels of capability within this population in a manner familiar to AF personnel. A final recommendation would be for AFRC program managers to develop and implement a countermeasure to address the wide variation in understanding of what the process managers are actually supposed to be doing for the units. In other words, how can the story, represented by the graphic in figure 7, be effectively and consistently communicated to AFRC leadership to drive unified action to build organic CPI practitioner capability across the command.

Figure 7. Overview of the AFRC CPI Program.



CONCLUSIONS

If it's true to say that what gets measured gets done, then it is reasonable to conclude that the contrapositive of that statement must also be true. Thus far in the history of the AFRC implementation of the AF CPI program, the things that can be measured don't paint a very positive picture concerning the current direction of the AFRC CPI program. The impression created by the measures derived and analyzed for this research is that a key ingredient is inconsistent and in some cases missing altogether – leadership. AFRC leaders at all levels must strive to learn how to lead a CPI-centric enterprise and integrate that knowledge into their daily standard work. CPI is a journey that must be lived – not just talked about every once in a while.

On the other hand, if AFRC leaders can't find it within themselves to shed their old paradigms and fully embrace the CPI lifestyle, they may prefer to remain in their comfort zones and make a risk (or risk-free) decision to keep operating in the manner that has enabled their career success thus far in their careers. Who could blame them?

In his book, "Lean Six Sigma Roundup: A case study of the largest deployment of Lean Six Sigma ever attempted", J.D. Sicilia, the first director of the DoD LSS program office, issued a warning about the perils of trying to deploy CPI without committed leadership buy-in:

*"I tell people that if they don't have a leader who is passionate about performance improvement via LSS, they shouldn't bother deploying at all. Doing so would only lead to disappointment and frustration by those who are committed and dedicated, and, when it eventually fails, would lower morale all around the organization."*¹⁰³

AF CPI is a commander's program, and commanders have broad authority to practice military operational art as they see fit to accomplish the mission as effectively and efficiently as possible. Each of them must decide how CPI best fits into their individual leadership practices. Until such time as a CPI mindset is embedded into the AFRC leadership culture, real transformation of the total culture may never occur.

¹ Matthews, Dylan, "The Sequester: Absolutely everything you could possibly need to know, in one FAQ", The Washington Post, 20 February 2013, Accessed: 20 April 2016.

<https://www.washingtonpost.com/news/wonk/wp/2013/02/20/the-sequester-absolutely-everything-you-could-possibly-need-to-know-in-one-faq/>

² Ibid.

³ Ibid.

⁴ Wynne, Michael W., Secretary of the Air Force, and Gen T. Michael Moseley, USAF, Chief of Staff, To ALL MAJCOM COMMANDERS, Memorandum. Subject: "Lean across the Air Force"—Process Development and Improvement, 7 November 2005.

⁵ Campbell, Lt Gen James L., Director of the Army Staff, To DISTRIBUTION, Memorandum. Subject: Transforming the Way We Do Business Execution Guidance, 8 Sep 2005.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Wynne, Michael W., Secretary of the Air Force, and Gen T. Michael Moseley, USAF, Chief of Staff, To ALL MAJCOM COMMANDERS, Memorandum. Subject: "Lean across the Air Force"—Process Development and Improvement, 7 November 2005.

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ Lopez, SSgt Todd C. "Air Force improving production with Smart Operations 21," Air Force Print News, 9 January 2009, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/132288/air-force-improving-production-with-smart-operations-21.aspx>.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Wynne, Michael W., secretary of the Air Force, Letter to Airmen: Air Force Smart Operations 21, 8 March 2006. <http://www.af.mil/library/viewpoints/secaf.asp?id=219>.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

²³ Winter, Donald C., Secretary of the Navy, To DISTRIBUTION, Memorandum. Subject: Transformation Through Lean Six Sigma, 3 May 2006.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid.

²⁸ England, Gordon, Deputy Secretary of Defense, To DISTRIBUTION, Memorandum. Subject: Establishment of DoD-wide Continuous Process Improvement (CPI) Programs, 11 May 2008.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

³² Davidson, William A., Administrative Assistance to the Secretary of the Air Force, To DISTRIBUTION C AND ALMAJCOM-FOA/CC Memorandum. Subject: Use of Guidance Memorandums for AFSO21, 27 February 2007.

³³ Ibid.

³⁴ Ibid.

³⁵ Poulin, Allan R., Maj Gen. Vice Commander, Air Force Reserve Command. To fellow AFRC leaders, Memorandum. Subject: No subject line, No date.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Davidson, William A., Administrative Assistance to the Secretary of the Air Force, To DISTRIBUTION C AND ALMAJCOM-FOA/CC Memorandum. Subject: Use of Guidance Memorandums for AFSO21, 27 February 2007.

³⁹ Ibid.

⁴⁰ Posner, BG John., Director, Air Force Smart Operations, and Ron Ritter, SES, Special Assistant to the SECAF for Smart Operations, To DISTRIBUTION, Memorandum. Subject: Sustaining AFSO21, 19 June 2008.

⁴¹ Ibid.

⁴² Stenner, Lt Gen Charles E. Jr., Commander, Air Force Reserve Command, To NAF/WING COMMANDERS AND HQ AFRC LIMITED STAFF, Memorandum. Subject: Optimizing Resources, 14 November 2008.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Sitrin, Col Eric M., Director, AFRC/A9 (CVO) and Edward Jones, AFRC/FM, To NAF/WING COMMANDERS AND HQ AFRC LIMITED STAFF, Memorandum. Subject: Deliberate Process for Optimizing Resources, 25 November 2008.

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Secretary of the Navy Instruction (SECNAVINST) 5220.14. Continuous Process Improvement (CPI), 13 May 2009, 1.

⁴⁹ Ibid.

⁵⁰ Ibid, 2.

⁵¹ Donley, Michael B., Secretary of the Air Force, and Gen Norton A. Schwartz, Chief of Staff, To ALL USAF COMMANDERS, Memorandum. Subject: Air Force Smart Operations (AFSO21), 8 June 2009.

⁵² Ibid.

⁵³ Lucchino, Carla E., Department of the Navy Assistant for Administration, Action Memo. Subject: SECNAVINST 5220.14 Continuous Process Improvement (CPI), 28 March 2014.

⁵⁴ Ibid.

⁵⁵ Tillotson, David III., SES, Director of Business Transformation and Deputy Chief Management Officer, Memorandum. Subject: Air Force Continuous Process Improvement Training, 23 April 2014.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ King, Dennis C., Col, USAF. Director, Transformation Outreach, To MASTER PROCESS OWNERS (MPOs), Memorandum. Subject: New IT solution for Continuous Process Improvement Management Tool (CPI-MT), 24 April 2014.

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Air Force Guidance Memorandum (AFGM) 2014-38-02, Air Force Smart Operations, 23 December 2014.

⁶² Ibid, 2

⁶³ Air Force Instruction (AFI) 33-360, Publications and Forms Management, 1 December 2015, 38.

⁶⁴ Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To MAJCOM A1s, Memorandum. Subject: Air Force Smart Operations Guidance Memorandum and Manpower, 9 January 2015.

⁶⁵ Air Force Guidance Memorandum (AFGM) 2014-38-02, Air Force Smart Operations, 23 December 2014, Para 4.8.

⁶⁶ Air Force Reserve Command Mission Directive (AFRCMD) 1124, Organization and Functions of Headquarters Air Force Reserve Command, 31 August 2011.

⁶⁷ Air Force Guidance Memorandum (AFGM) 2014-38-02, Air Force Smart Operations, 23 December 2014, Atch 1.

⁶⁸ Ibid, 4.11.1.

⁶⁹ Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To MAJCOM A1s, Memorandum. Subject: Air Force Smart Operations Guidance Memorandum and Manpower, 9 January 2015.

⁷⁰ Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To Installation/Wing Commanders, Memorandum. Subject: Air Force Smart Operations Guidance Memorandum and Your Manpower Office, 9 January 2015.

⁷¹ Air Force Reserve Command Manpower Standard (AFRCMS) 1010CO, Wing/Group Process Manager, 11 May 2015, 1.

⁷² King, Dennis C., Col, Director of Transformation Outreach, To MAJCOM/DRU/FOA MPOs AND AF CPI BLACK BELTS, Memorandum. Subject: Standardization of AF CPI Green Belt Training, 1 June 2015.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Zarodkiewicz, Patricia J., Administrative Assistant to the Secretary of the Air Force, To DISTRIBUTION C, Memorandum. Subject: Establishing the Deputy Undersecretary of the Air Force (Management), Program Guidance Letter L15-06, 29 October 2015.

⁷⁹ Ibid.

⁸⁰ Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To A1s, Memorandum. Subject: Air Force Continuous Process Improvement (CPI) Execution Guidance Memorandum, 14 January 2016.

⁸¹ Ibid.

⁸² Ibid.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ Jackson, James F., Lt Gen, Commander, Air Force Reserve Command. To AFRC NAF COMMANDERS AND AFRC WING COMMANDERS, Memorandum. Subject: Creating a Culture of Continuous Process Improvement (CPI) in AFRC, 2 March 2016.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Ibid.

⁹¹ Ibid.

⁹² Department of Defense Instruction (DoDI) 5010.43, Implementation and Management of the DoD-Wide Continuous Process Improvement/Lean Six Sigma (CPI/LSS) Program, 17 July 2009, Enclosure 2, 6.

⁹³ AFGM 2014-38-02, 3.

⁹⁴ Department of Defense Instruction (DoDI) 5010.43, Implementation and Management of the DoD-Wide Continuous Process Improvement/Lean Six Sigma (CPI/LSS) Program, 17 July 2009, Enclosure 2, 6.

⁹⁵ Ibid.

⁹⁶ SAF/US(M), Directorate of Business Transformation, Air Force Smart Operations for the 21st Century Playbook, October 2009, C-17.

⁹⁷ Air Force Guidance Memorandum (AFGM) 2014-38-02, Air Force Smart Operations, 23 December 2014, 12.

⁹⁸ Ibid.

⁹⁹ SAF/US(M), Directorate of Business Transformation, Air Force Smart Operations for the 21st Century Playbook, October 2009, 83 & 131.

¹⁰⁰ Ibid, 134.

¹⁰¹ AF CPI Portal, READ ME FIRST AF CPI Lexicon, Accessed: 20 April 2016, [https://cs3.eis.af.mil/sites/OO-TR-AF-43/cpi/Training%20Materials/01%20Training%20Material%20\(Restricted%20to%20Installation%20and%20MAJC%20OM_DRU_FOA%20MPO\)/02.%20Green%20Belt%20Course%20Materials/00%20-%20READ%20ME%20FIRST/READ%20ME%20FIRST%20AF%20CPI%20Lexicon.docx](https://cs3.eis.af.mil/sites/OO-TR-AF-43/cpi/Training%20Materials/01%20Training%20Material%20(Restricted%20to%20Installation%20and%20MAJC%20OM_DRU_FOA%20MPO)/02.%20Green%20Belt%20Course%20Materials/00%20-%20READ%20ME%20FIRST/READ%20ME%20FIRST%20AF%20CPI%20Lexicon.docx)

¹⁰² Ibid.

¹⁰³ Sicilia, J.D., LEAN SIX SIGMA ROUNDUP: A case study of the largest deployment of Lean Six Sigma ever attempted, Bloomington, IN: AuthorHouse, 17 December 2009, 9.

BIBLIOGRAPHY

AF CPI Portal, *READ ME FIRST AF CPI Lexicon*, Accessed: 20 April 2016,
[https://cs3.eis.af.mil/sites/00-TR-AF-43/cpi/Training%20Materials/01%20Training%20Material%20\(Restricted%20to%20Installation%20and%20MAJCOM_DRU_FOA%20MPO\)/02.%20Green%20Belt%20Course%20Materials/00%20-%20READ%20ME%20FIRST/READ%20ME%20FIRST%20AF%20CPI%20Lexicon.docx](https://cs3.eis.af.mil/sites/00-TR-AF-43/cpi/Training%20Materials/01%20Training%20Material%20(Restricted%20to%20Installation%20and%20MAJCOM_DRU_FOA%20MPO)/02.%20Green%20Belt%20Course%20Materials/00%20-%20READ%20ME%20FIRST/READ%20ME%20FIRST%20AF%20CPI%20Lexicon.docx)

Air Force Guidance Memorandum (AFGM) 2014-38-02, *Air Force Smart Operations*, 23 December 2014.

Air Force Instruction (AFI) 33-360, *Publications and Forms Management*, 1 December 2015.

Air Force Reserve Command Manpower Standard (AFRCMS) 1010CO, *Wing/Group Process Manager*, 11 May 2015.

Air Force Reserve Command Mission Directive (AFRCMD) 1124, *Organization and Functions of Headquarters Air Force Reserve Command*, 31 August 2011.

Campbell, Lt Gen James L., Director of the Army Staff, To DISTRIBUTION, Memorandum. Subject: Transforming the Way We Do Business Execution Guidance, 8 Sep 2005.

Davidson, William A., Administrative Assistance to the Secretary of the Air Force, To DISTRIBUTION C AND ALMAJCOM-FOA/CC Memorandum. Subject: Use of Guidance Memorandums for AFSO21, 27 February 2007.

Department of Defense Instruction (DoDI) 5010.43, *Implementation and Management of the DoD-Wide Continuous Process Improvement/Lean Six Sigma (CPI/LSS) Program*, 17 July 2009.

Donley, Michael B., Secretary of the Air Force, and Gen Norton A. Schwartz, Chief of Staff, To ALL USAF COMMANDERS, Memorandum. Subject: Air Force Smart Operations (AFSO21), 8 June 2009.

England, Gordon, Deputy Secretary of Defense, To DISTRIBUTION, Memorandum. Subject: Establishment of DoD-wide Continuous Process Improvement (CPI) Programs, 11 May 2008.

Jackson, James F., Lt Gen, Commander, Air Force Reserve Command. To AFRC NAF COMMANDERS AND AFRC WING COMMANDERS, Memorandum. Subject: Creating a Culture of Continuous Process Improvement (CPI) in AFRC, 2 March 2016.

King, Dennis C., Col, Director of Transformation Outreach, To MAJCOM/DRU/FOA MPOs AND AF CPI BLACK BELTS, Memorandum. Subject: Standardization of AF CPI Green Belt Training, 1 June 2015.

King, Dennis C., Col, USAF. Director, Transformation Outreach, To MASTER PROCESS OWNERS (MPOs), Memorandum. Subject: New IT solution for Continuous Process Improvement Management Tool (CPI-MT), 24 April 2014.

Lopez, SSgt Todd C. "Air Force improving production with Smart Operations 21," *Air Force Print News*, 9 January 2009,
<http://www.af.mil/News/ArticleDisplay/tabcid/223/Article/132288/air-force-improving-production-with-smart-operations-21.aspx>.

Lucchino, Carla E., Department of the Navy Assistant for Administration, Action Memo. Subject: SECNAVINST 5220.14 Continuous Process Improvement (CPI), 28 March 2014.

Matthews, Dylan, "The Sequester: Absolutely everything you could possibly need to know, in one FAQ", *The Washington Post*, 20 February 2013, Accessed: 20 April 2016.
<https://www.washingtonpost.com/news/wonk/wp/2013/02/20/the-sequester-absolutely-everything-you-could-possibly-need-to-know-in-one-faq/>

Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To MAJCOM A1s, Memorandum. Subject: Air Force Smart Operations Guidance Memorandum and Manpower, 9 January 2015.

Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To Installation/Wing Commanders, Memorandum. Subject: Air Force Smart Operations Guidance Memorandum and Your Manpower Office, 9 January 2015.

Murphy, Richard M., Brig Gen, Director of Manpower, Org and Resources, To A1s, Memorandum. Subject: Air Force Continuous Process Improvement (CPI) Execution Guidance Memorandum, 14 January 2016.

Posner, BG John., Director, Air Force Smart Operations, and Ron Ritter, SES, Special Assistant to the SECAF for Smart Operations, To DISTRIBUTION, Memorandum. Subject: Sustaining AFSO21, 19 June 2008.

Poulin, Allan R., Maj Gen. Vice Commander, Air Force Reserve Command. To fellow AFRC leaders, Memorandum. Subject: No subject line, No date.

SAF/US(M), Directorate of Business Transformation, *Air Force Smart Operations for the 21st Century Playbook*, October 2009.

Secretary of the Navy Instruction (SECNAVINST) 5220.14. *Continuous Process Improvement (CPI)*, 13 May 2009.

Sicilia, J.D., *LEAN SIX SIGMA ROUNDUP: A case study of the largest deployment of Lean Six Sigma ever attempted*, Bloomington, IN: AuthorHouse, 17 December 2009.

Sitrin, Col Eric M., Director, AFRC/A9 (CVO) and Edward Jones, AFRC/FM, To NAF/WING COMMANDERS AND HQ AFRC LIMITED STAFF, Memorandum. Subject: Deliberate Process for Optimizing Resources, 25 November 2008.

Stenner, Lt Gen Charles E. Jr., Commander, Air Force Reserve Command, To NAF/WING COMMANDERS AND HQ AFRC LIMITED STAFF, Memorandum. Subject: Optimizing Resources, 14 November 2008.

Tillotson, David III., SES, Director of Business Transformation and Deputy Chief Management Officer, Memorandum. Subject: Air Force Continuous Process Improvement Training, 23 April 2014.

Winter, Donald C., Secretary of the Navy, To DISTRIBUTION, Memorandum. Subject: Transformation Through Lean Six Sigma, 3 May 2006.

Wynne, Michael W., Secretary of the Air Force, and Gen T. Michael Moseley, USAF, Chief of Staff, To ALL MAJCOM COMMANDERS, Memorandum. Subject: “Lean across the Air Force”—Process Development and Improvement, 7 November 2005.

Wynne, Michael W., secretary of the Air Force, Letter to Airmen: Air Force Smart Operations 21, 8 March 2006. <http://www.af.mil/library/viewpoints/secaf.asp?id=219>.

Wynne, Michael W., Secretary of the Air Force, To ALL MAJCOM AND DRU/CCs, Memorandum. Subject: Air Force Smart Operations for the 21st Century (AFSO21) Standardized Organization Structure Codes (OSCs), 16 February 2007.

Zarodkiewicz, Patricia J., Administrative Assistant to the Secretary of the Air Force, To DISTRIBUTION C, Memorandum. Subject: Establishing the Deputy Undersecretary of the Air Force (Management), Program Guidance Letter L15-06, 29 October 2015.